LAND USE, DEVELOPMENT, AND HABITAT PROTECTION

5

NHCP

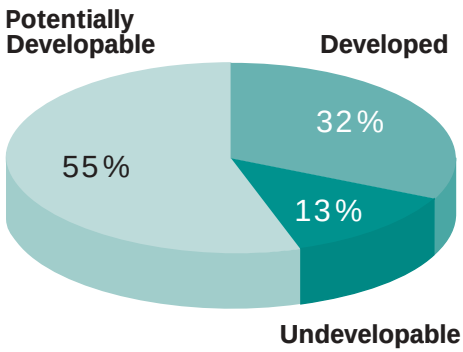
Atlantic coast: Hampton and Seabrook

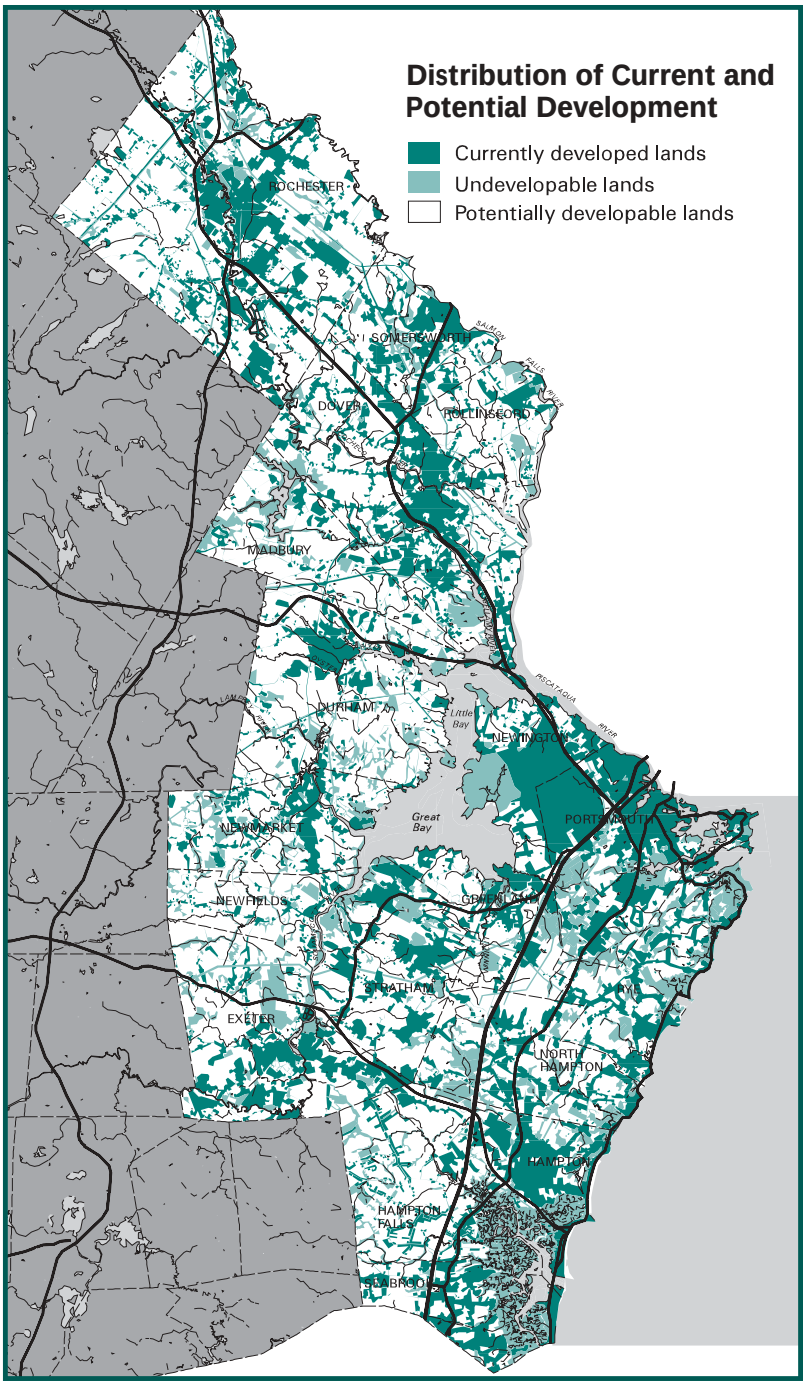
Population growth and development are the greatest challenges to New Hampshire's estuarine ecosystems. The NHEP's goals for land use, development, and habitat protection in the coastal watersheds of New Hampshire focus on human activities and use of land and other natural resources. NHEP's land-use goals aim to protect estuarine water quality, habitat, and aesthetic and other quality-of-life values as the region's population continues to grow. Human needs dependent on local natural resources include current and future water supplies, aesthetic and recreational values, safe harvesting and consumption of shellfish, health and sustainability of fisheries, and more.

The NHEP land use and habitat protection Action Plans relate directly to the priorities and problems addressed in Chapter 4: Water Quality. For example, stormwater runoff and wastewater treatment facility overflows are major contributors of pollutants to estuarine waters. Sound planning and provision of adequate sewage treatment for a growing population are critical. Future patterns of development and infrastructure will greatly affect estuarine water quality and habitats.

Impervious surfaces created in the built environment (buildings and roofs, paved surfaces, etc.) add to the volume and velocity of storm-water, sending more pollutants and sediments through drains and tributaries or directly into the estuaries. **Shoreland development** can destroy the natural buffering of vegetation against soil erosion and runoff. It also destroys wildlife habitat and travel corridors, and alters scenic vistas from both shore and water. Land-consuming and

Current and Potential Land Development in the 19 Coastal New Hampshire Municipalities





Developed, undeveloped, and potentially developable lands in coastal New Hampshire

scattered **sprawl development** patterns fragment wildlife habitat and corridors.

The problems and impacts caused by development and human interaction with the estuarine ecosystems are complex, diffuse, and pervasive. Humans are part of the complex and dynamic interactions between land and fresh and saltwaters, cultural and economic activities, and natural processes.

Land-use decisions made in the 43 coastal watershed communities will shape the future landscape and waterscape of the region, and will greatly influence both the estuarine environment and quality of life for residents and visitors. The Land Use and Habitat Protection Action Plans detail ways to achieve the goals of protecting water quality, habitat, and other important natural resource values. These Action Plans are interrelated with those for Water Quality, Shellfish Resources, Habitat Restoration, and Public Outreach and Education. All of these together comprise the comprehensive *Plan*.

WHY IT MATTERS

Many of the detrimental impacts on water quality and living resources are linked to human activities within the watersheds of the estuaries. Development of land for residential, commercial, industrial, and other uses can greatly increase stormwater runoff and other sources of estuarine water pollution. Human population growth and conversion of open land for development causes loss and fragmentation of habitat, stresses wildlife, and diminishes remaining habitat. Development patterns are consuming land at a faster rate than indicated by growth in population. Shoreland development and sprawl development in the watershed detract from the aesthetic values and rural character which attract people to the region, diminishing quality of life and recreational opportunities.

We have focused our land use planning and regulatory efforts on the impacts of development which directly affect water quality and aquatic habitats. We must now begin to evaluate the impacts of changing land use on terrestrial habitats, which also in turn alters water quality. By using available

land-use planning tools we can help protect the rich biodiversity of the coastal region.

The New Hampshire Ecological Reserves Project has recognized this area of the state–which comprises the New Hampshire portion of the Southern New England Coastal Lowland Eco-Region–as needing extensive conservation work to protect the region's unique biodiversity.

Two particularly important types of estuarine habitat are salt marshes and eelgrass beds. Both play economically and ecologically important roles in two critical estuary functions: **nursery to fish and shellfish resources**, and **filtering and purifying water**. Salt marshes also have a role in preventing coastal flooding. Salt marshes within the estuary support about 70 species of flowering plants, including about 20 that are unique to salt marsh habitats.

New Hampshire's estuarine waters support 95 species of phytoplankton, 169 species of seaweeds, and numerous beds of eelgrass, a submerged marine flowering plant. Eelgrass is particularly important as a filter for suspended sediments and dissolved nutrients, and for its roles in the life cycles of scallops, crabs, finfish, and waterfowl. Two-thirds of New Hampshire's commercially harvested fish rely on the estuaries at some point in their life cycles.

Many residents and visitors enjoy the abundant wildlife supported by the estuaries. The Great Bay Estuary is a major feeding and resting area for migratory birds, and hosts nesting ospreys and overwintering bald eagles. New Hampshire's estuaries have played a supporting role in the dramatic comeback of the striped bass.

LIFE IN AND AROUND THE ESTUARIES

Estuaries serve as nurseries, habitat, feeding, and resting areas for a diverse array of life – from the tiniest phytoplankton and zooplankton to tall trees, seals, and bald eagles. The health of the larger, more visible life forms depends on the health and availability of the whole system.

S. MIRICK

Snowy egret

Plant life in the estuarine watersheds ranges from tiny phytoplankton suspended in estuarine waters to the large trees of upland forests. Botanists have identified 67 rare plant species within the watershed, about a dozen associated with estuarine environments.

Animal life in the watersheds embraces a multitude of aquatic and terrestrial animals – from 32 kinds of microscopic invertebrates called zooplankton, to shellfish to large birds and mammals. Two species of freshwater and terrestrial invertebrates found in the watershed are considered globally rare: the banded bog skimmer dragonfly and a freshwater mussel called the brook floater. Vertebrate animals inhabiting the coastal watersheds include 248 native species: 46 mammals, 142 birds, 14 amphibians, 16 reptiles, and 63 fish. Non-native fish, bird, and mammal species also occur in the watershed.

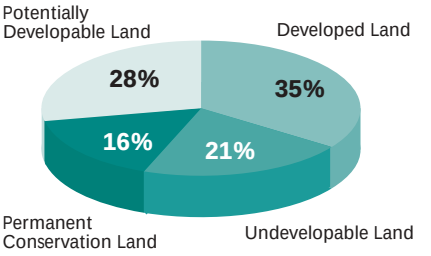
The coastal watersheds are the only place in New Hampshire to find the harbor seal; eight bird species – mute swan, piping plover, willet, common tern, golden-winged warbler, sharp-tailed sparrow, and seaside sparrow; and the American brook lamprey, a fresh-water fish species. Another five bird species – double-crested cormorant, snowy egret, little blue heron, black-crowned night-heron, glossy ibis – nest on offshore islands and forage extensively in the mainland estuaries. Thirteen state-listed threatened or endangered birds and one federally-listed endangered fish occur in the watersheds.

The uplands of New Hampshire's coastal region provide important stopover habitat for migratory birds and bats using the Atlantic flyway, as well as important breeding habitat. The Great Bay and Hampton-Seabrook estuaries provide important migration and wintering habitat for 20 species of waterfowl, 27 species of shorebirds, and 13 species of wading birds. The Seacoast is New Hampshire's primary waterfowl wintering area, with Great Bay supporting about 75% of the state's wintering population

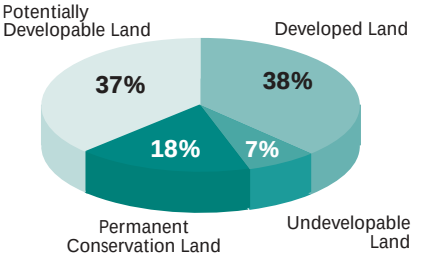
Shorelands are land within 300 feet of the water's edge.

Potential Development of Tidal Shorelands

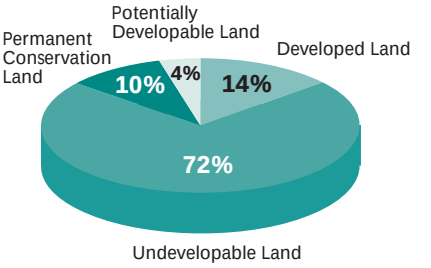
New Hampshire Shoreline



Great Bay Estuary



Hampton-Seabrook Estuary



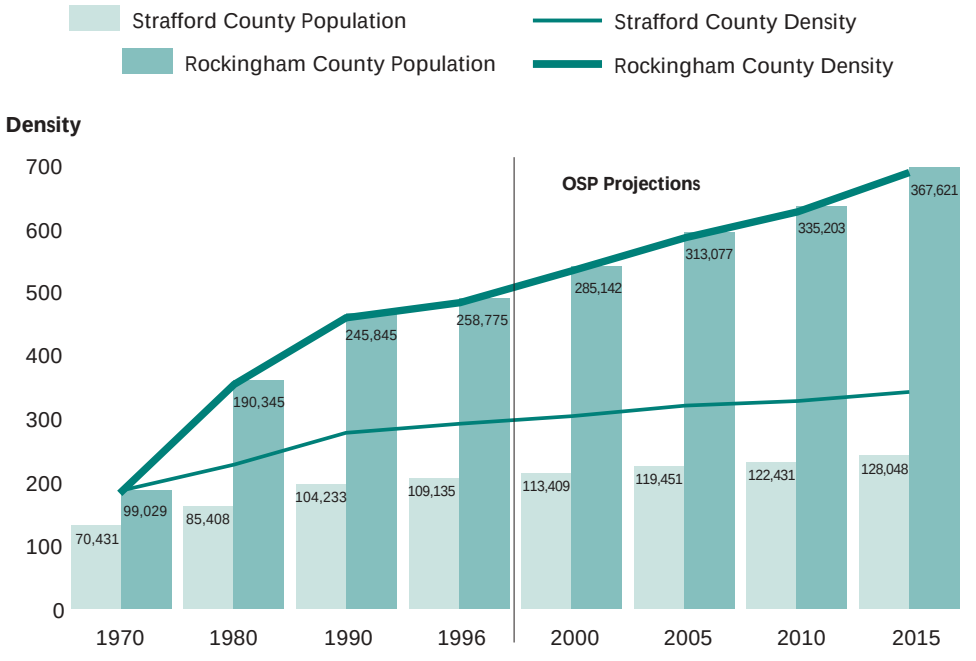
THE CHALLENGE

The human population in Rockingham and Strafford Counties is projected to grow 17% from 1998 to 2005. Pressure to develop land for residential, commercial, industrial, and other uses will intensify with population growth. In the NHEP Zone A consisting of 19 coastal area towns (see map on inside front cover), approximately 30% of the land area is currently developed. NHEP studies show an additional 55% of the total land area has development potential. Future development could make current problems worse, and would most likely create new problems. However, many of these detrimental effects on the estuarine environment can be managed or reduced through careful planning of development, and by protecting shorelands, wetlands, and other critical habitats for rare, endangered, and other important species.

Knowledge and awareness of the productive and ecological value of

Office of State Planning projections for Rockingham and Strafford Counties, New Hampshire: 1970-2015

Population Growth and Human Density



estuaries has grown rapidly in recent decades. During these same decades population growth and development in New Hampshire's Seacoast region have accelerated.

NHCP

Salt marsh restoration at Awcomin Marsh

The challenge for New Hampshire's estuaries is to balance human uses and population growth with maintaining the ecological integrity of these systems, so fundamental to the region's appeal for residents, tourists, and businesses. These aesthetic, recreational, and economic values are reflected in the high property values of waterfront real estate. Proximity to water makes property more desirable for development – and more vulnerable to environmental impacts from development. New Hampshire needs to take care that its estuaries are not 'loved to death.'

Research, monitoring, and stewardship efforts have also expanded through the 1990s. We have learned a great deal about the natural resources of New Hampshire's estuaries, how human activities affect water quality and aquatic life, and how people benefit from these resources. Monitoring programs, non-point source pollution assessments, and natural resource evaluations have built upon the body of information gathered over the years. The NH Coastal Program and UNH Complex Systems Research Center are using Global Information Systems information to measure and map all the various estuarine habitat types. This growing body of knowledge is helping to identify the problems in the estuaries, the causes, and ways to minimize problems.

Development is the leading cause of habitat loss and alteration within the coastal watershed, leading to significant net decrease in habitats capable of supporting wildlife and natural communities. The marked pressure from development on the coastal watershed has had detrimental impacts on the region's wildlife and natural communities. The New Hampshire Comparative Risk Project found that the most pronounced overall habitat loss in New Hampshire has occurred within the southeastern part of the state.

Different species have differing abilities to tolerate and adapt to habitat changes. Most native species, however, are unable to survive and reproduce in heavily developed areas. Habitat loss and alteration lead to changes in species composition within the watershed. Habitat specialists – such as wood thrush and fisher – disappear from urbanized areas, while habitat generalists (including some non-native species) such as house sparrows, pigeons, starlings, rats, and raccoons, increase. Remaining natural habitats are influenced and modified by adjacent land uses. Suburban habitats are prone to water and soil contamination, reduced air quality, and spread of invasive species.

Since development is the leading cause of habitat loss and alteration within the coastal watershed, protecting habitat is directly tied to land-use decisions,

and to planning and tax policy. Conversion of open land to development causes considerable net loss of habitats capable of supporting wildlife and natural communities, and causes further impacts to remaining adjacent or nearby natural habitats.

- Annual losses of forest land to development over the last 30 years have been estimated at about 1000 and 3000 acres (.2-.5%) in Strafford and Rockingham counties respectively, totalling approximately 15%.
- Agricultural land in Strafford and Rockingham counties combined has declined from 472,000 acres in 1850 to 42,000 acres in 1996.
- Human-caused tidal restrictions have altered more than 1,300 acres of salt marsh, 20% of the total remaining salt marsh area.
- Of all New Hampshire freshwater wetlands permits issued in 1995, 50% of the affected acres were located in Strafford and Rockingham Counties.
- In addition to preventing the travel of anadromous fish to historical spawning grounds, dams along New Hampshire's tidal rivers have nearly eliminated freshwater tidal marshes from the state.
- Coastal development now blocks the remaining dune systems from the natural wind-dynamics essential to maintain them.

NHCP

Development along tidal wetlands

Habitat fragmentation occurs when large, contiguous tracts of habitat are broken into smaller, more isolated patches. Residential and commercial development and construction of roads and utility corridors fragment habitats. Impacts of fragmentation on natural communities vary with the size and isolation of the habitat patch, the type of adjacent land use, road and waterway traffic volume, and the level of human activity. As the human population in the coastal watershed grows, the need for new housing, schools, and roads will result in more fragmented habitats. Road densities and forest-patch sizes are useful indicators of habitat fragmentation. In 1996 road density in the coastal watershed was the second highest in the state, at 4.94 miles of road per 1000 acres. The coastal watershed's average forest-patch size of 55.6 acres was second lowest in the state.

Water quality and quantity are essential to the ecological integrity and function of New Hampshire's estuaries. Estuarine habitats' quality and function depend on the quality of fresh and tidal waters flowing into them. Human activities throughout the watershed have degraded water quality in numerous ways – oil spills, dams, treated and untreated sewage, and runoff from impervious surfaces such as roofs and pavement. The major water quality problems in the Great Bay Estuary and coastal waters are discussed in Chapter 4.

Water quantity is also an important factor in habitat quality and function. Water quantity issues in the Seacoast region are increasing as the demands for municipal water supplies grow. Water withdrawals from rivers, lakes, and ponds may ultimately affect plants, animals, and natural communities that require particular water levels to meet their biological needs. Restrictions to tidal flows and quantities can seriously degrade or alter salt marsh habitats. Increased impervious surfaces and stormwater from developed areas can increase the volume of freshwater delivered to estuarine waters, altering salinity and other water quality factors that affect the living resources of the estuaries. Increased impervious surfaces, and loss of vegetation-covered land, can reduce groundwater recharge capacity.

Invasive species are another threat to the diverse array of native plant and animal species and communities that inhabit New Hampshire's estuaries and coastal watershed. The competition that results from historical and continuing introductions of non-native plants and animals from around the world can lead to reduced growth and survival for native species. Especially competitive and prolific introduced species are called invasive because they can reduce the overall biodiversity of an ecosystem, and may even cause complete displacement of native species. Although most invasive species have not significantly altered natural communities within the watershed, a few species are having considerable impact on the estuaries, for example green crabs, common reed or *Phragmites australis*, and purple loosestrife. Invasive species are often opportunistic, gaining advantage where other habitat threats occur, such as water quality and quantity impacts, soil disturbance, habitat fragmentation, and development.

NHCP

Phragmites in the Awcomin Marsh

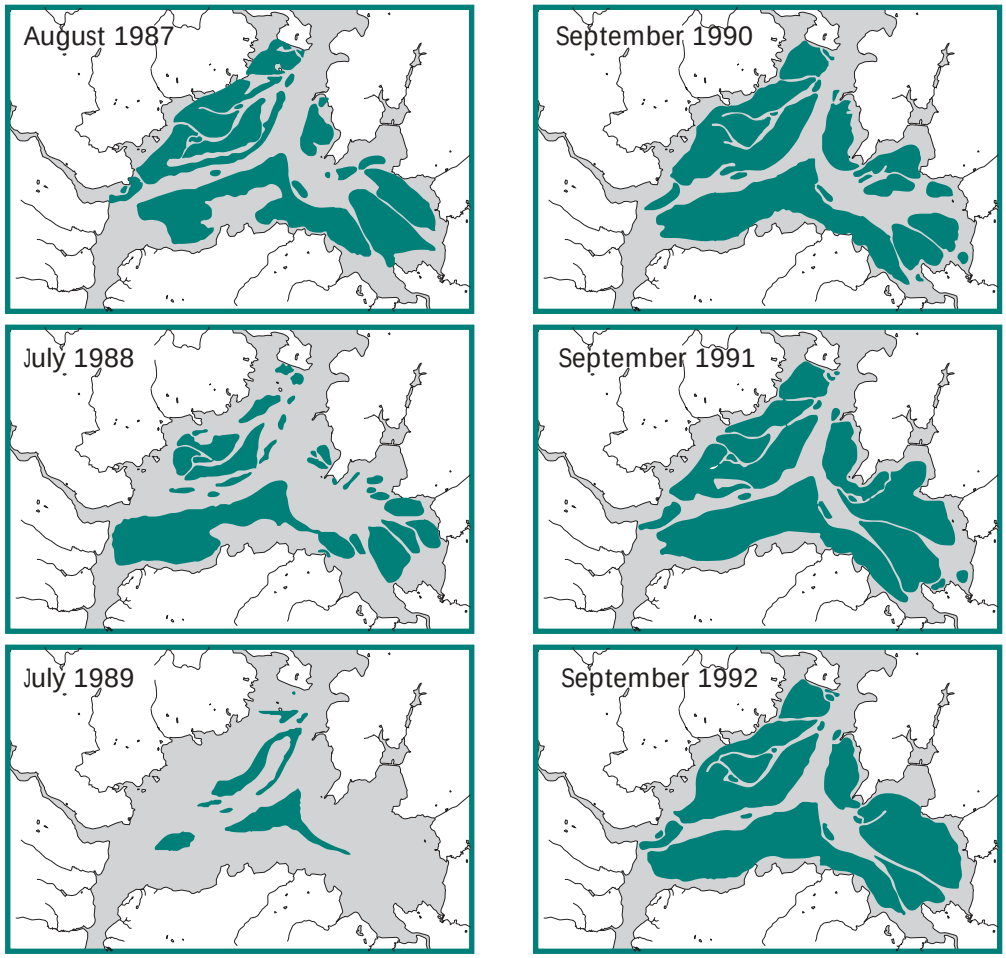
- Introduced in the early 1900s, green crabs have been identified as a major predator of juvenile shellfish in the Great Bay Estuary. Green crabs also threaten efforts to restore eelgrass beds, because their foraging and burrowing activities kill and dislodge planted shoots.
- Encroachment of invasive plant species is an indicator of salt marsh degradation. *Phragmites australis* (common reed) invades salt marshes that have been degraded by human encroachment. Undersized culverts, tide gates, dredging and filling activities, and stormwater runoff interfere with the natural hydrology of the marsh, making affected areas susceptible to invasion by non-native plants.

Phragmites becomes a problem after it colonizes disturbed soils surrounding or within marshes. These invasive marsh plants can replace desirable wildlife food plants, restrict bird and fish access to the marsh, and drastically reduce plant diversity. This species is visibly altering salt marshes within the estuaries.

Diseases are normal components of ecosystems, occurring through interactions of a pathogen, its host, and their environment. Altered or degraded environmental conditions can increase the occurrence and/or severity of the disease. Changes in water temperature, the presence of toxic contaminants, and overcrowding due to loss of habitat are all examples of environmental changes that can add stress, and reduce resistance to disease.

One example is the recent epidemic of the eelgrass wasting disease that caused dramatic losses of underwater estuarine eelgrass habitat in Great Bay and the Piscataqua River. Mortality as high as 80% of the eelgrass population in the Great Bay Estuary occurred each year in the 1980s. Since then, eelgrass has exhibited considerable re-growth in many of its former beds with the exception of a few areas in Little Bay. Eel grass wasting disease was first recognized in Great Bay in the 1940s. From the well known Great Bay report written by C.F. Jackson in 1944, it appears the initial onslaught of the myxomycete *laburinthula sp.* in Great Bay was in the 1930s.

Sarcomatous neoplasia is a lethal form of leukemia in clams, with the potential to cause extensive mortalities in softshell clams. To date the Hampton-Seabrook Estuary is the only known site of *neoplasia*- infected clams in New Hampshire. In 1987 some Hampton-Seabrook Estuary clamflats exhibited up to 50% mortality attributed to *neoplasia*. Between 1990 and 1995 adult clam densities quadrupled on the Middle Ground, remained stable on the Common Island flats, and decreased by 50% in the Hampton River. *Neoplasia* may have contributed to the decline in the Hampton River over this period.



Time series of eelgrass distribution in Great Bay.

The oyster diseases MSX and Dermo, caused by the protozoan parasites *Haplosporidium nelsoni* and *Perkinsus marinus* respectively, have recently been detected in oysters from the Great Bay Estuary. Although the parasite was first detected in the Piscataqua River in 1983, mortalities from MSX were first observed in 1995. Oysters in the Salmon Falls and upper Piscataqua rivers were most affected, with mortalities of up to 83% in some beds. Varying degrees of Dermo infection have been found in oysters from the Great Bay Estuary, but to date no oyster mortalities have been attributed to Dermo.

NHCP

Summer crowds at Wallis Sands State Beach, Rye

Human disturbance can directly affect wildlife species by altering wildlife behavior. Many of these changes are of short duration, although long-term behavioral changes, such as abandonment of preferred foraging areas and changes in food sources, do occur. Human activity can also alter habitat and damage or destroy plants. Development or recreational activities can alter characteristics of soil, vegetation, or aquatic systems. Such alterations may affect an animal's food supply, shelter, or living space. Impacts on food and living space may influence behavior, survival, reproduction, and/or distribution.

- Recreational activity on beaches is a major factor in the decline of the endangered piping plover. Human activity has disrupted nest sites, caused nest abandonment, and affected breeding success.
- Although oyster and some types of clam harvesting may improve shellfish productivity, standard recreational clam digging practices can reduce juvenile clam density by 50% through physical damage and exposure to predators.
- Recreational boating is a popular and fast-growing activity in the Great Bay Estuary. Many marinas are located in sheltered inlets, where anchors and propellers are likely to impact eelgrass and salt marsh habitats. Frequent motorboat activity can disturb nesting and foraging areas of aquatic species, and even prevent wildlife access to those areas depending on the level of activity.

REGULATORY AND MANAGEMENT PROGRAMS

While problems such as contaminants in estuarine water and declining shellfish populations persist, recent success stories show that management can make a dramatic difference even in a relatively short time. Examples include significant water quality improvements due to upgraded wastewater treatment, and the rebound of the striped bass thanks to Maryland's efforts in Chesapeake Bay, and the availability of summer feeding areas such as Great Bay and Hampton-Seabrook Harbor.

The *Ecological Reserve System Project* brought together more than 30 agencies and organizations involved in natural resource management and conservation to identify opportunities to conserve biodiversity in New Hampshire. The final report contains an analysis of the status of biodiversity in the state, and recommendations to maintain or enhance the current situation.

The New Hampshire Fish and Game Department (NH F&G) is responsible for management of all wildlife and fish in the **state**. They share responsibility for migratory birds, interjurisdictional fish, and threatened and endangered species with the U.S. Fish and Wildlife Service (USFWS). Different species receive varying levels of management attention, according to status as game or non-game, endangered, threatened, or "of special concern." NH F&G also owns and manages many of the sites providing access to tidal and non-tidal waters in the watershed.

The New Hampshire Natural Heritage Inventory (NHNHI) within the NH Department of Resources and Economic Development (NH DRED) tracks known locations of rare plants and animals, and works to define the types and distributions of natural communities in the state.

The New Hampshire Coastal Program within the New Hampshire Office of State Planning (NH OSP) provides technical assistance and natural resource information to local communities, assures consistency between existing laws and state and federal activities within the coastal zone, and administers an annual grants program for municipalities and non-governmental organizations working in the coastal zone.

The **federal** Endangered Species Act of 1973 and the New Hampshire Endangered Species Conservation Act of 1979 protect wildlife species most in danger of disappearing from the state and/or region. Five federally-listed species and 20 state-listed species occur in the coastal region. Some species, such as the piping plover and osprey, breed within the region and are closely monitored and managed. Other species, such as the peregrine falcon and northern harrier, are present only during migration. Protection for plant species listed under the federal Endangered Species Act of 1973 is similar to that for listed wildlife.

New Hampshire currently lacks comprehensive protection for state-listed threatened, endangered, or rare plant species. However, applicants for state wetlands permits must identify known locations of rare plants in their project area, and work to eliminate or minimize impacts on this resource. The Native Plant Protection Act of 1987 provides some protection for listed species on state and federal lands, through the jurisdiction of the New Hampshire Natural Heritage Inventory.

GBNERR

Great Bay mudflats at low tide.

New Hampshire has recently focused considerable attention on coordinated non-point source (NPS) pollution control and prevention efforts, involving all **state** agencies with NPS-related responsibilities. The Office of State Planning, Regional Planning Commissions, and Conservation Districts all provide planning assistance to municipalities to prevent runoff problems that can result from development. The Coastal Non-point Pollution Control Program is coordinating with the state's Clean Water Act NPS program to assess existing regulatory frameworks and needs on a watershed basis. Studies of the coastal watersheds have begun.

Local governments in New Hampshire have authority to establish zoning ordinances and development regulations that give them the potential to exert substantial control over non-point source pollution. Zoning, subdivision regulations, and site-plan review procedures may include requirements for stormwater and erosion control; regulation of septic design, siting, and installation; and may address prohibited uses, open space requirements, and more. Zoning overlays can further protect shoreline habitats, wetlands, and other important natural resources from development. Municipalities and community groups can also acquire open space land, or protect it with easements, to preserve buffers for estuary or other water resources or to protect habitat.

Significant variations exist in regulation of development among municipalities. This variation reflects the diversity of communities in the region, even among those sharing common boundaries or watersheds, and New Hampshire's tradition of local control. For example, seven of the 19 coastal communities have Shoreland Protection Districts considered complete by state standards, while eight others have partial shoreland protection provisions. In certain cases

GBNERR

these inconsistencies can have impacts on the estuaries, which has lead the NHEP Land Use Team to suggest some coordinated and cooperative efforts among towns and cities in the estuarine watershed.

New Hampshire **state** laws and programs which help protect land and habitat include the Current-Use Taxation Program, Comprehensive Shoreland Protection Act, Rivers Management and Protection Act, Wetlands Law, Site Specific Program, NH Endangered Species Act, and NH Native Plant Protection Act. The recently enacted Land and Community Heritage Investment Program holds promise of new land protection opportunities for New Hampshire communities.

Federal laws related to these issues include the Clean Water Act, Coastal Zone Management Act, Wild and Scenic Rivers Act, National Flood Insurance Program, National Environmental Protection Act, Fish and Wildlife Coordination Act, Marine Mammal Protection Act, Magnuson Fisheries Conservation and Management Act, and Endangered Species Act.

EPA published new regulations on December 8, 1999 for Phase II of the NPDES permit stormwater management program. Compliance with these Phase II rules will be required by March 2003. Under Phase II rules, NPDES permit coverage will be required for small municipal separate storm sewer systems in urbanized areas – including Dover, Durham, Madbury, New Castle, Newington, Portsmouth, Rochester, Rollinsford, Rye, and Somersworth. Phase II NPDES stormwater rules will also apply to discharges from construction sites disturbing between one and five acres.

A working group led by the NH Office of State Planning has begun preparing for the technical assistance communities will need as they begin to address the requirements of the Phase II NPDES program. Working group members include some of the communities that will be affected by Phase II, NH OSP/ Coastal Program, NH DES, and NH DOT.

Clean Water Act Section 303(d) and its implementing regulations require states to list water body segments as impaired – defined as out of compliance with a water quality goal or designated use such as swimming or fishing, even after targeted pollution control practices have been implemented to address the problem. The Clean Water Act requires that this impaired waters list include a prioritized ranking of segments most in need of Total Maximum Daily Load (TMDL) analysis. The TMDL defines the maximum amount of a specific pollutant that can be discharged into a body of water without violating water quality goals for that water. NPDES permits and state wastewater discharge licenses are written to be consistent with the TMDL waste load allocations for the receiving water body. TMDLs are being developed and implemented for the Rochester segment of the Cocheco River for dissolved oxygen, and for the Salmon Falls River downstream of Somersworth for dissolved oxygen and phosphorous.

GOALS FOR LAND USE, DEVELOPMENT, AND HABITAT PROTECTION

The Action Plans for land use have been designed to protect estuarine water quality and habitat areas. They are drafted around the themes of future development, wetland protection, shoreland protection, land conservation, and outreach education. See *Appendix 3* sections on Land Use and on Habitat Protection and Restoration for complete lists of goals and objectives.

- Protect water quality in the estuaries and the rural quality of the watershed by encouraging development patterns in the coastal New Hampshire watersheds that limit impervious surfaces, buffer shorelands, and prevent sprawl.
- Protect and enhance the area and environmental quality of tidal wetlands or salt marshes, essential to the functioning and health of estuarine and marine ecosystems.
- Use buffers or setbacks along tidal and freshwater shorelands to protect estuarine water quality and other estuarine values such as habitat and scenic views.
- Protect estuarine water quality by ensuring that groundwater impacts are minimized.
- Allow no net loss of freshwater wetland functions in the New Hampshire coastal watershed.
- Maintain habitats of sufficient size and quality to support populations of naturally occurring plants, animals, and communities.
- Communities, government agencies, organizations, and individuals actively participate in achieving the goals for land use and habitat protection for New Hampshire's estuaries.

LAND USE AND HABITAT PROTECTION
ACTION PLANS

Future Development

Sprawl

Tidal Wetlands

Shorelands

Groundwater

Freshwater Wetlands

Habitat Protection

ACTION LND-1

Prepare a report of current and future levels of imperviousness for the subwatersheds of the NH coastal watershed.

PRIORITY
+++ FUTURE DEVELOPMENT

BACKGROUND

Research from several areas in the country indicates that the overall health and ecological integrity of streams can generally be assessed by the degree of watershed imperviousness (roadways, parking lots, rooftops, etc.). A series of studies reviewed by the Center for Watershed Protection in Maryland indicates that generally watersheds with less than 10% impervious cover are protected from adverse water quality and biological impacts, while those above 10% tend to show higher degrees of impairment and degradation with increasing percent impervious cover. Although many NH Seacoast towns include limits to impervious cover in some zoning districts, these are not applied with the goal of limiting impervious cover in ecologically important watersheds within the town.

Managing impervious surface area to protect water quality is a complex issue. Uniform low-density zoning may succeed at limiting impervious surfaces, but may also encourage sprawl development. Managing overall impervious surface coverage may require dense development in some areas (e.g. around town centers), with protected lands and low-density development in other areas to yield an acceptable net impervious surface area.

ACTIONS/ACTIVITIES

Prepare and distribute a report of current and future imperviousness for subwatersheds of the NH coastal watershed. The Lamprey River watershed is proposed as the target watershed for the initial report, because it appears to have varying levels of imperviousness and because it straddles the regions of both Strafford and Rockingham Planning Commissions. The report will include:

1. Define and map second order subwatersheds (CSRC).
2. Estimate current amount and percent impervious surface by subwatershed (CSRC).
3. Project build-out amount and percent impervious surface by subwatershed, based on current zoning (OSP/NHCP and Regional Planning Commissions).
4. The completed report would be distributed to all municipal land-use boards and conservation commissions in the target watershed. Other Seacoast land-use boards and interested parties (e.g., developers, environmental groups) would be informed of the findings of the report, and of the possible next steps their communities can take (including those in this chapter), through direct mailing. Coastal outreach organizations, including the NHEP, would be responsible for widely distributing the report's findings through the media and other means.

RESPONSIBLE PARTIES

The two regional planning commissions and/or OSP/NHCP would be primarily responsible for preparing the report (Step 3 and 4). The UNH Complex Systems Research Center will conduct the GIS work (Steps 1 and 2).

IMPLEMENTATION LOCATION

This action will likely be implemented in the Lamprey River watershed with specific subwatersheds being determined by the responsible parties. Project methodology may be transferred to other subwatershed locations in the Great Bay and coastal watersheds.

COSTS

Research and report preparation in Steps 1-3	$35,000
Communications, outreach, and report distribution in Step 4	$5,000
Total cost	**$40,000**

FUNDING

Sub-watersheds were delineated for the Lamprey River watershed in 1999 with US EPA-NHEP implementation funds. A needs assessment to define methods for estimating impervious surface is funded by NHCP in 2001 (Step 2). Additional steps may be funded with NOAA Coastal Services Center funds, USGS Assistance to State Water Resources Research Institutes, or through other Federal programs identified in Tables 10.1 to 10.6 of this document.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

This report will generally raise awareness of the issues with impervious cover, and lay the groundwork for future work in planning for, and controlling, the inevitable increases in impervious cover that will occur with future growth. Water quality, habitat, and scenic values in the estuarine region will benefit from more effective planning for impervious cover from new development.

MONITORING AND ENFORCEMENT

No monitoring or enforcement is required.

TIMETABLE

Steps 1 and 2 were initiated in 2000. The remaining steps will be initiated by 2004.

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PRIORITY

Highest Priority. Other land-use Action Plans would be enhanced by completion of this report (e.g., LND-2, LND-17, et al).

ACTION LND-2

Implement steps to limit impervious cover and protect streams at the municipal level.

PRIORITY
+++ FUTURE DEVELOPMENT

BACKGROUND

Research from several areas in the country indicates that the overall health and ecological integrity of streams can generally be assessed by the degree of watershed imperviousness (roadways, parking lots, rooftops, etc.). A series of studies reviewed by the Center for Watershed Protection in Maryland indicates that generally watersheds with less than 10% impervious cover are protected from adverse water quality and biological impacts, while those above 10% tend to show higher degrees of impairment and degradation with increasing percent impervious cover. In a document entitled Site Planning for Urban Stream Protection, the Center for Watershed Protection outlines seven steps that land-use authorities can take to enhance protection of critical waterways and ecosystems.

ACTIONS/ACTIVITIES

Ideally, following completion of the report developed in Action Plan LND-1, one pilot project will be implemented in a target watershed (e.g., Lamprey River). The Regional Planning Commissions and/or UNH Cooperative Extension will select one community to pilot the seven-step stream protection strategy detailed in Site Planning for Urban Stream Protection. These seven steps are:

1. Watershed-based zoning based on projected level of impervious cover for watersheds or subwatersheds.
2. Protection of sensitive areas such as streams, wetlands, floodplains, shorelands, and critical habitat from development
3. Establish a stream buffer network.
4. Modify subdivision code to reduce creation of impervious cover, by utilizing narrower streets, green parking lots, subdivisions with smaller lots and more open space, etc.
5. Limit the disturbance and erosion of soils during construction, including use of non-structural controls (sequencing, footprinting, etc.).
6. Treat the quantity and quality of stormwater runoff by installing and maintaining stormwater BMPs.
7. Maintain stream protection infrastructure through BMP maintenance, enforcement, public outreach/pollution prevention, and stream monitoring.

Before implementing the seven steps, outreach efforts on the benefits of the above steps will be made to municipal officials, developers, and other interested parties. If the pilot community projects are successful, these programs

will be repeated for other towns in the coastal watersheds. This ongoing program will assist each community in improving municipal codes and practices with respect to impervious surfaces and stormwater runoff controls, and provide professional staff assistance to each community for following up on the training/education program.

RESPONSIBLE PARTIES

Lead parties will be the Strafford Regional Planning Commission and Rockingham Planning Commission, with assistance from UNH/Cooperative Extension (Steps 1-7).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

Estimated cost per community:	
Code work in Step 4	$15,000
Communications in Steps 1-7	$5,000
Training for the Conservation Commission in 7-Step methodology (Steps 1-7)	$2,500
Total	**$22,500**

FUNDING

This project will be funded with federal US EPA-NHEP implementation funds in 2001.

REGULATORY NEEDS

Implementation of all seven steps will likely require substantial revisions to local land-use regulations.

EXPECTED BENEFITS

Improved protection of natural resources and environmental quality.

MONITORING AND ENFORCEMENT

Implementation of the seven steps will require at least as much enforcement of local regulations as currently exists, if not more.

TIMETABLE

This pilot project will be completed by 2002.

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PRIORITY

Highest Priority. Implementation of this action will be strengthened by the completion of Action LND-1, and could be improved by the completion of Action LND-3 of the *NHEP Management Plan*. Action LND-17 could be implemented in conjunction with LND-2, et al.

ACTION LND-3

Conduct research in coastal NH watersheds to examine the relationship between percent impervious cover and environmental degradation.

PRIORITY

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FUTURE DEVELOPMENT

BACKGROUND

Research from several areas in the country indicates that the overall health and ecological integrity of streams can generally be assessed by the degree of watershed imperviousness (roadways, parking lots, rooftops, etc.). A series of studies reviewed by the Center for Watershed Protection in Maryland indicates that generally watersheds with less than 10% impervious cover are protected from adverse water quality and biological impacts, while those above 10% tend to show higher degrees of impairment and degradation with increasing percent impervious cover. These studies have largely been conducted in the mid-Atlantic states, an area of differing climate and generally higher levels of development. The purpose of this project is to examine the validity of these relationships for the climate and land-use patterns of the northeastern U.S., particularly coastal New Hampshire.

PROJECT OBJECTIVES AND METHODS

The purpose of this research project is to:

1 Define the functional relationship between watershed imperviousness and stream ecological integrity; and

2 Utilize the relationship to assess the ecological integrity of subwatersheds in the coastal basin.

The project will utilize UNH Complex Systems-generated impervious cover data to determine the percent imperviousness of subwatersheds in the coastal basin. A subset of 20-30 subwatersheds in the coastal watershed with varying increments of imperviousness will be selected for comparative sampling to assess stream ecological integrity. The sampling protocol will produce consistent data on hydrologic, morphologic, water quality, habitat and biodiversity variables within each subwatershed, thus generating quantitative expressions of stream ecological integrity. The sampling data will be statistically and graphically analyzed to determine the presence of relationships between imperviousness and stream quality.

ACTIONS/ACTIVITIES

1 Delineate and categorize subwatersheds: The UNH Complex Systems Research Center (CSRC) will accomplish this task according to the standard data development procedures of GRANIT, the NH State Geographic Information [GIS] System.

2a Select 20-30 subwatersheds for field sampling: Up to five second order reference streams will be selected, based on their lack of urban development, lack of confounding non-point and point sources of pollution, natural channels, good habitat structure, and impervious cover of less than

5%. Other subwatersheds of varying levels of imperviousness will be selected to obtain the widest possible range of percent-imperviousness. To the maximum extent practicable, all subwatersheds will have drainage areas from 100 to 500 acres, a known level of imperviousness, age, and presence or absence of Best Management Practices, and will be free of confounding sources (active construction, mining, agriculture, or point sources).

2b Sample subwatersheds: For each subwatershed, three random, non-overlapping, 100-foot reaches of stream will be selected for summer and winter sampling of selected variables in each of five key variables groups:

- Hydrologic variables: summer dry weather flow, wetted perimeter, cross-sectional area of stream, peak annual storm flow (if gauged).
- Channel morphology variables: channel alteration, height, angle and extent of bank erosion, substrate embeddedness, sediment deposition, substrate quality.
- Water quality variables: summer water temperature, conductance, dissolved oxygen.
- Habitat variables: pool-riffle ratio, pool frequency, depth and substrate, instream cover, riffle substrate quality, riparian vegetative cover, riffle embeddedness.
- Ecological variables: macroinvertebrate diversity

3 Data analysis: Graphical and statistical procedures will be used to quantify the relationship between watershed imperviousness and stream quality

4 Information Dissemination: Create graphs of each stream quality variable compared to stream imperviousness, a coastal watershed map depicting subwatersheds by imperviousness percentage, 43 town-based maps depicting subwatersheds by imperviousness percentage, and digital versions of all graphical products.

RESPONSIBLE PARTIES

The lead implementer will be NH DES (Steps 2a, 2b, 3, 4), with assistance from NHCP and UNH Cooperative Extension (Steps 2b, 3, 4), and UNH Complex Systems Research Center (Step 1).

IMPLEMENTATION LOCATION

This action will be implemented in field locations in the Great Bay watershed.

FUNDING

NHCP funded a mini version of three sub-watersheds in 2000. This project would likely be funded through a variety of sources, rather than by a single organization. Sources could include the US EPA NHEP implementation funds, the NH Coastal Program, UNH/CICEET, the NH Department of Environmental Services Biomonitoring Program, and UNH Cooperative Extension. Other federal funding programs identified in tables 10.1 to 10.6 of this document may be available for support of this project.

COSTS

Estimated two-year project. Expanded water quality sampling for toxins, turbidity, and other parameters would be desirable, but are not included here.

Staff NH DES Project Manager (half time) in Steps 1-4	$60,000
UNH/CSRC GIS services in Step 1	$24,000
UNH Coop. Extension services in Steps 2b-4	$20,000
Interns/volunteer training in Steps 2b	$10,000
Equipment (Computer, field equipment) in Steps 2b	$10,000
Supplies (Copying, etc.) in Step 2b	$ 5,000
Lab/Field Costs (Hydrolab) in Step 2b	$ 7,000
D.O./conductivity field meter in Step 2b	$ 2,000
39 staff gauges in Step 2b	$ 1,800
Flow meter in Step 2b	$ 1,000
39 temp. Meter/logger (HOBO) in Step 2b	$ 4,200
Macroinvert. Sampling Supplies in Step 2b	$ 5,500
Macroinvert. Analysis (contracted) in Step 2b	$22,500
Field log books, film, etc. in Step 2b	$ 300
Total	**$173,300**

REGULATORY NEEDS

NH Fish and Game Department may require a scientific permit for some invertebrate sampling.

EXPECTED BENEFITS

- Greater understanding of the effects of impervious cover on stream health.
- Information which could be used to assess the ecological integrity of other coastal NH watersheds.
- New Hampshire-specific scientific information on which to base recommendations for limits of impervious cover.

MONITORING AND ENFORCEMENT

None identified.

TIMETABLE

A three-watershed version of this project was completed in 2001 by NHCP. An expanded study will be initiated by 2004. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

PRIORITY

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High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, although its completion will improve the effectiveness of other actions such as Action LND-2. The results of Action LND-1 would provide some of the information needed to select subwatersheds for the studies outlined in this Action Plan.

FUTURE DEVELOPMENT

PRIORITY

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ACTION LND-4

Prevent the introduction of untreated stormwater to wetlands by supporting the development of NH Minimum Impact Development Guidelines.

BACKGROUND

The NH Comparative Risk Project completed a report in 1998 that ranked environmental threats in the state of New Hampshire. A number of the threats identified were related to development. In response to these findings, the NH Comparative Risk Project is coordinating an effort to develop voluntary guidelines and practices intended for use by towns, developers, and others. The practices will be designed to minimize air, land, and water pollution; habitat loss and fragmentation; and energy use resulting from future development.

ACTIONS/ACTIVITIES

1 Through the efforts of technical working groups facilitated by the NH Comparative Risk Project, prepare report of written practices and indicators of minimum-impact development for residential, commercial/industrial, and institutional development addressing.

- Building siting, design, construction, operation, and maintenance.
- Site development of impervious surface, vegetation, public and private spaces, etc.
- Infrastructure support of roads, utilities, communications, safety, etc.
- Integration with the neighborhood.
- Regional setting that maintains diversity of development density.

2 Once the report is complete, work with communities and developers to encourage adoption of these practices.

RESPONSIBLE PARTIES

NH Comparative Risk Project as lead organization (Steps 1-2), with participation from developers, lenders, insurance agencies, planners, scientists, local and state government, environmental conservation organizations, utilities, citizens, and others.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Total cost of $250,000, almost half of which is already secured through federal grants.

FUNDING

This action may be funded in small part through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds or in-kind contributions may be available through natural resource management agencies such as NH DES and NH OSP.

REGULATORY NEEDS

None identified, as the practices are intended to be voluntary. However, some towns may choose to incorporate the recommended practices into local land-use regulations.

EXPECTED BENEFITS

Reduced air, land, and water pollution; habitat loss and fragmentation; and energy use resulting from future development.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

This Priority action was initiated in 2000 and will be completed by 2002. Outreach and implementation of practices will be ongoing.

PRIORITY

Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

FUTURE DEVELOPMENT

PRIORITY
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ACTION LND-5

Support the Natural Resource Outreach Coalition (NROC) municipal decision-maker land-use planning outreach method modeled after the University of Connecticut cooperative extension's non-point education for municipal officials (NEMO) program.

BACKGROUND

The Great Bay National Estuarine Research Reserve, NHEP Land Use Project Team, and the Natural Resources Outreach Coalition have been re-evaluating the way natural resource-based planning information is provided to Seacoast region land-use decision-makers. A study commissioned by the Research Reserve investigated the planning information needs of area land-use decision-makers through a survey and a number of follow-up interviews. The study drew several conclusions:

1. The boards' regulatory and administrative responsibilities consume most of their meeting time, leaving little time for long-term planning.
2. Most volunteer committee members do not have the time or resources to attend traditional workshops, or read volumes of technical support materials. The study suggests the best way to reach this audience is with direct presentations scheduled in advance into their regular meeting schedule.
3. If natural resource-based planning language is not already incorporated into the town master plan and by-laws, it is difficult to require specific natural resource considerations in new site plan determinations.
4. Internet access to information is increasing among board and committee members, often through home computers. Many local officials have become aware of the power of Geographic Information Systems, but most do not have a complete understanding of the technology and its power as an analytical tool in land-use planning applications.

With these findings in mind, the Natural Resources Outreach Coalition convened a meeting of Seacoast land-use planning and outreach organizations to discuss how they could better address the needs of local decision-makers and municipal land-use planners. The group developed an extensive list of natural resource topics central to land-use planning efforts. The group also agreed on the need for a creative educational and technical support outreach vehicle to incorporate natural resource-based planning into local decision-making to protect natural resources.

The group developed a pilot program that would employ a team of land-use, natural resource and outreach professionals to work with one or two communities. Work would focus on issues and concerns specific to the particular town, using the expertise of the program team to establish a foundation for integrating natural resource-based thinking into the planning process. The Connecticut NEMO model and its focus on impervious surfaces, water quality, and land use, was discussed at this meeting. The group concluded that

although NEMO was a valuable educational model, the outreach effort for the New Hampshire Seacoast should explore other unifying themes as well as impervious surfaces.

ACTIONS/ACTIVITIES

1. Develop a multi-organization, coordinated effort using new educational tools based on the NEMO model to deliver land-use planning information to communities. This program will present land-use planning information in a simpler, more understandable manner using language and topics familiar to most municipal officials. The ultimate goal of this educational program is for natural resource issues to be included as a fundamental consideration in local planning and land-use decisions (complete, piloted in 1999-2000).
2. Identify an appropriate lead coordinating organization or agency with extensive community education and planning expertise. Establish a sustainable structure for the core group of land-use planners, educators, and municipal officials involved in piloting the program. The pilot has been developed, marketed and implemented using NH OSP and NH DES/Regional Planning Commission funding and NROC professional staff time.
3. Provide programs to communities.

RESPONSIBLE PARTIES

Currently coordinated by the New Hampshire Coastal Program (Step 1), the NROC includes the NH Estuaries Project, NH DES, UNH Cooperative Extension, Strafford Regional Planning Commission, Rockingham Planning Commission, and Great Bay National Estuarine Research Reserve. The Conservation Law Foundation, the Audubon Society of New Hampshire, Strafford County Conservation District, USDA Natural Resources Conservation Service, EPA, and UNH Complex Systems Research Center also endorse NROC. The working partners will deliver the educational materials and coordinate the follow-up technical support (Steps 2-3).

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Program development and current implementation are supported through existing staff resources and some funding from NH Coastal Program and NH DES (Steps 1, 3). One full-time staff person housed within one of the partner agencies can coordinate this program. Implementation will require resources from multiple partners. If the program is extended beyond the Seacoast region, staff and administrative costs will rise proportionately. Annual estimate for one full-time equivalent is $50,000 (Step 2). Additional costs for follow-up assistance are yet to be determined. Ongoing programming requires supporting costs estimated at $30,000/year (Step 3).

FUNDING

The NHEP has allocated $30,000 of its current implementation funds for this project in 2000, 2001, and 2002. Additional funds may be available through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. Additional support also comes from in-kind services from Natural Resources Outreach Coalition partners.

EXPECTED BENEFITS

- Natural resource issues will become a fundamental consideration in local land-use planning and decision-making.
- NHEP land-use Actions will be supported by this educational effort.
- Preserve the unique character of coastal New Hampshire.

TIMETABLE

This Highest Priority action was initiated in 1999 and will be ongoing.

+++

PRIORITY

Highest Priority: Implementation of this action is fundamental to achieving the Land Use and Habitat Preservation goals chapter of the *NHEP Management Plan*. Many of the concepts, messages and outreach activities proposed in Chapter 5: Land-Use, Development and Habitat Protection will be incorporated as key elements of the new educational programs.

ACTION LND-6

Minimize urban sprawl in coastal watersheds.

PRIORITY
+++ SPRAWL

BACKGROUND

A New Hampshire legislative study on land use management and farmland preservation published in October 1998 defines sprawl as "the haphazard and unplanned development of and use of land, be it physically, visually, or audibly, in such a manner that is contrary to the traditional and historic New Hampshire landscape." The study further defines sprawl as "the inflation, over time, in the amount of land area consumed per unit of human activity, and the degree of dispersal between such land areas." Many of the results of this haphazard and accelerated consumption of land represent a potential threat to water quality in adjacent estuarine areas. The results of haphazard and accelerated consumption of land include:

- loss and fragmentation of agricultural, forest, wildlife habitat, and wild lands
- increased air and water pollution, as well as risk of flooding
- aesthetic degradation of the landscape
- abandonment of commercial activities in cities and towns
- development of strip malls and shopping centers that congest the roads and eliminate open spaces
- proliferation of signs along highways
- increased levels of noise
- grid-type housing developments
- loss of vibrant villages and city centers, traditional character, and sense of community

Recent federal, regional, and state initiatives are responses to problems caused by sprawl. At the federal level, the Clinton-Gore livability agenda promotes cooperative action among federal agencies to provide communities with new tools and resources to preserve green spaces, ease traffic congestion and pursue 'smart growth' strategies. US EPA, US DOT, US HUD, US General Services Administration, US Department of Interior, US Department of Health and Human Services, Department of Defense (through the Army Corp of Engineers), US Department of Justice, US Postal Service, US Department of Energy, and the US Department of agriculture, have joined forces to promote regional New England 'smart growth' initiatives to cooperatively seek solutions to the environmental, social, and economic problems posed by sprawl. In New Hampshire the governor signed an executive order instructing key agencies to determine ways in which rules, regulations, granting programs, and

actions could be improved to reduce the consequences of sprawl. These state agencies include the Office of State Planning, Department of Environmental Services, and Department of Transportation.together these federal, regional and state initiatives on sprawl sponsor a set of actions including:

- studies to determine the local impacts of sprawl
- reviews of existing programs, rules, regulations, funding, etc., that contribute to sprawl
- education to raise public awareness and inform local decision-makers regarding sprawl
- expanded funding for land protection, conservation, and preservation
- greater use of technology to study sprawl (e.g., GIS)
- new land-use tools for municipalities to control sprawl
- new partnerships: inter-municipality, inter-regional, or inter-agency collaborations to address sprawl-related issues

ACTIONS/ACTIVITIES

The following set of six recommended action plans (LND6a to LND6f) for the New Hampshire estuaries and coastal watershed area are designed to complement these federal, regional, and state initiatives. This approach aims to build on existing actions that have already been developed and identified for potential funding.

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds. Different communities in the great bay and coastal watersheds will require different levels and types of information and assistance.

COSTS

Estimated total cost for implementation of Actions 6a-6f over 5 years: $498,000

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
LND-6A	26,000					$26,000
LND-6B	30,000					$30,000
LND-6C	12,000	6,000	6,000	6,000	6,000	$36,000
LND-6D		28,000				$28,000
LND-6E	30,000	12,000	12,000	12,000	12,000	$78,000
LND-6F	60,000	60,000	60,000	60,000	60,000	$300,000
TOTAL	**$158,000**	**$106,000**	**$78,000**	**$78,000**	**$78,000**	**$498,000**

FUNDING

These projects would likely be funded through a variety of sources, rather than by a single organization. Sources could include the US EPA NHEP implementation funds, the NH Coastal Program, UNH/CICEET, the NH Department of Environmental Services Biomonitoring Program, and UNH Cooperative Extension. Other federal funding opportunities, including NOAA, USGS, and US EPA programs, identified in tables 10.1 to 10.6 of this document may be available for support of this project.

REGULATORY NEEDS

Information generated in Action LND-6B and implementation of some anti-sprawl tools developed in Action LND-6E and pursued through Action LND-6F could lead to regulatory changes at the local level.

EXPECTED BENEFITS

Less urban sprawl, better protection of natural resources, and preservation of more of the region's traditional and rural character.

MONITORING AND ENFORCEMENT

Enforcement of revised land use regulations will be at the local level.

TIMETABLE

See the detail of specific Action Plans 6A through 6F.

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PRIORITY

Highest Priority. Results will be most effective if all actions (LND-6A to 6F) are implemented, although some could be implemented even if others are not.

SPRAWL

PRIORITY

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ACTION LND-6A

Develop a regional pilot partnership to create a smart growth vision among Towns and Regional Planning Commissions in a single estuarine watershed.

ACTIONS/ACTIVITIES

This Action would use a community visioning exercise for consensus on goals for growth, community and regional character, natural resources preservation, and overall quality of life. Based on the outcome of this exercise, a watershed master plan that articulates the values and goals expressed by the community would be developed. The Oyster River and Lamprey River watersheds are recommended for this project due to existing local interest, presence of many important natural resources, diversity of current land use patterns, and history of cooperation among Lamprey River communities in river protection under the NH Rivers Management Protection Program and the federal Wild and Scenic Rivers designation program. The long-term intent of this activity is to develop similar partnerships in other coastal watersheds.

RESPONSIBLE PARTIES

Strafford Regional Planning Commission will act as lead agency with participation of Rockingham Planning Commission.

IMPLEMENTATION LOCATION

The initial focus of this Action Plan will be the Oyster River watershed communities. However, it may be implemented in any or all of the sub-watersheds in the NH coastal watershed.

COSTS

0.1 full-time equivalent at Strafford Regional Planning	$6,000
Community visioning consultant	$20,000
Total	**$26,000**

FUNDING

US EPA NHEP implementation funds will be used to implement this action in 2000-2001.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Coordinated development plans and enhanced protection preserving community character and resources.

MONITORING AND ENFORCEMENT

None identified.

TIMETABLE

This Highest Priority action will be completed by 2002.

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PRIORITY

Highest Priority. This Action Plan will be implemented by SRPC in the Oyster River watershed starting in Fall 2000. Implementation of this action is considered important to achieving the overall intent of Action LND-6.

SPRAWL

PRIORITY

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ACTION LND-6B

Conduct a comprehensive review of the 43 towns within the estuaries and coastal watershed area to determine land-use polices that affect sprawl.

ACTIONS/ACTIVITIES

1. Comprehensively review the land-use polices of the 43 municipalities within the estuaries and coastal watershed area to identify those policies that affect sprawl. The NHEP Base Programs Analysis documented environmental regulations in the 19 coastal municipalities, and will be useful in this review.
2. Use the review results to develop guidelines to help communities bring land-use policies in line with state, regional, and federal anti-sprawl initiatives.
3. The overall goal of these guidelines will be to maintain the unique character of each community, to protect natural resources, to maintain a high quality of life, and to ensure future prosperity and economic potential. Policies that affect estuarine water quality will be emphasized.

RESPONSIBLE PARTIES

Strafford Regional Planning Commission as lead agency with participation of Rockingham Planning Commission (Steps 1-3).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

Estimated cost is $30,000 for 0.5 full-time equivalent at Strafford and/or Rockingham Planning Commission (Steps 1-3).

FUNDING

This project is funded with an EPA Sustainable Development Challenge Grant. Additional work may be funded with federal US EPA-NHEP implementation funds, NOAA Coastal Services Center funds, USGS Assistance to State Water Resources Research Institutes, or through other federal programs identified in tables 10.1 to 10.6 of this document.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Will enable communities to target their anti-sprawl efforts more effectively on those activities, regulations, etc., which are contributing to sprawl.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

The Regional Planning Commission Project funded by EPA will be completed by 2001. Additional activities (as needed) to complete this action will be initiated by 2005.

PRIORITY

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High Priority. Implementation of this action is considered important to achieving the overall intent of Action LND-6.

SPRAWL

PRIORITY

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ACTION LND-6C

Develop and maintain a comprehensive database or library of new smart growth funding programs.

ACTIONS/ACTIVITIES

1 Regional Planning Commissions develop and maintain a comprehensive, up-to-date database or library of new anti-sprawl funding programs that builds on existing lists of funding programs, in both digital and hard-copy formats. Federal, regional, and state agencies will be restructuring existing funding programs to encourage land-use development that avoids sprawl. These same agencies, in concert with private organizations, will be developing new sources of open space and natural resource preservation funding to further assist in achieving this goal.

2 Assist coastal watershed municipalities that (1) have a major impact on estuarine water quality and (2) have developed strong anti-sprawl land-use policies, to acquire funding from these sources.

RESPONSIBLE PARTIES

Either Strafford Regional Planning Commission or Rockingham Planning Commission will manage funding for the library for the coastal watershed area (Step 1). Regional planning commissions will assist member communities in securing funds (Step 2).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

0.2 full-time equivalent in year 1 and 0.1 full-time equivalent in years 2-5 (Steps 1-2):

Year 1	Year 2	Year 3	Year 4	Year 5	Total
12,000	6,000	6,000	6,000	6,000	**$36,000**

FUNDING

This action may be funded through US EPA NHEP implementation funds or through other federal programs identified in tables 10.1 to 10.5 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action. Local funds from regional planning commission dues or in-kind contributions toward the project may also be appropriate.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Achieving higher levels of funding for community anti-sprawl programs will greatly enhance the likelihood of completing such initiatives.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

Initiate by 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

PRIORITY

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High Priority. Implementation of this action is considered to be moderately important to achieving the overall intent of Action LND-6.

SPRAWL

PRIORITY

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ACTION LND-6D

Develop a science-based handbook and video on the nature, causes, and remedies of sprawl for audiences in the coastal New Hampshire watershed area.

ACTIONS/ACTIVITIES

This educational initiative would create a science-based handbook and video for audiences in the coastal New Hampshire watershed area on the nature, causes, and remedies of sprawl. It would explain the direct connection between sprawl growth and estuarine water quality. The audience for the handbook will be the general public, including schools, youth and community organizations, and adult education programs.

RESPONSIBLE PARTIES

The NH Estuaries Project and the NH Office of State Planning can oversee document and video production.

IMPLEMENTATION LOCATION

The educational product called for in this action can be distributed to the 43 towns in the Great Bay and coastal watersheds, via the NHEP, NH Office of State Planning, UNH Cooperative Extension, the Strafford and Rockingham Regional Planning Commissions, or other groups participating in regional planning outreach activities.

COSTS

0.3 full-time equivalent	$18,000
Materials for handbook and video	$10,000
Total	**$28,000**

FUNDING

Can be funded through US EPA NHEP implementation funds or through state anti-sprawl and “smart-growth” initiatives.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

This educational effort will help explain the reasons for and benefits of anti-sprawl efforts. Many anti- sprawl actions will involve changes to local land-use regulations and zoning, which require approval by residents.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

Initiate by 2007. This Priority action will be implemented as funds and resources become available.

PRIORITY

Priority. This work should be coordinated with the development guidelines in Action LND-21 and other related work. Implementation of this action is considered to be of minor importance to achieving the overall intent of Action LND-6.

SPRAWL

PRIORITY

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ACTION LND-6E

Contribute to the development of new smart growth planning tools, with particular emphasis on provisions that protect estuarine water quality.

ACTIONS/ACTIVITIES

1. The NH Office of State Planning will be the lead agency in developing new model ordinances, regulations, codes, best management practices, and planning concepts that avoid sprawl.
2. Promote these new tools to assist local communities (planning boards, zoning boards, conservation commissions, codes officers, and other town officials).

RESPONSIBLE PARTIES

NH Office of State Planning and Strafford and Rockingham Regional Planning Commissions will be responsible for developing new tools (Step 1). Strafford and Rockingham Regional Planning Commissions will be responsible for the transfer of information and the delivery of assistance to member communities (Step 2). The Conservation Law Foundation and the Minimum Impact Development Project may also assist in the action since both organizations are developing smart growth tools (Steps 1-2).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

0.5 full-time equivalent in Year 1 in Step 1	$30,000
0.2 full-time equivalent in Years 2-5 ($12,000/year) in Step 2	$48,000
Total	**$78,000**

FUNDING

Increased budgets for RPCs have been included in the FY01 state budget. This funding will increase RPC capacity to implement Step 2. Funding for LND-4 to support Minimum Impact Development will also support this action. Additional funds may come through US EPA NHEP implementation funds, EPA Sustainable Development Challenge Grants, or through other federal programs identified in tables 10.1 to 10.5 in the *NHEP Management Plan*.

REGULATORY NEEDS

Some new instruments might involve changes to state statutes relative to zoning and land-use regulation.

EXPECTED BENEFITS

Strengthened capability of municipalities to develop a planning framework that avoids sprawl.

MONITORING AND ENFORCEMENT

None required to develop tools.

TIMETABLE

Initiate by 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

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PRIORITY

High Priority. Implementation of this action is considered to be moderately important to achieving the overall intent of Action LND-6.

SPRAWL

PRIORITY

+++

ACTION LND-6F

Assist communities that embrace a strong smart growth philosophy to conduct comprehensive reviews of existing regulations, identify sources of funding, provide public education, and implement new land-use tools.

ACTIONS/ACTIVITIES

1. Regional Planning Commissions (RPCs) will assist communities that embrace a strong anti-sprawl philosophy to conduct comprehensive reviews of local and state land use policies and regulations;
2. Identify funding sources (RPCs);
3. Provide public education (RPCs and NROC);
4. Implement new land-use tools (RPCs).

RESPONSIBLE PARTIES

The Rockingham and Strafford Regional Planning Commissions will act as lead agencies with assistance from state agencies (e.g., Office of State Planning, Department of Environmental Services, etc.) and federal agencies (US Environmental Protection Agency, et al.) (Steps 1-4). Natural Resource Outreach Coalition will assist with public education (Step 3).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

$30,000 for 0.5 full-time equivalent per year, for each Regional Planning Commission (Steps 1-4).

FUNDING

This action may be funded through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. Funding for LND-5 to support NROC will also support this action. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action. Local funds from regional planning commission dues or in-kind contributions toward the project will also be available.

REGULATORY NEEDS

Implementing some new land-use tools may require new or amended regulations.

EXPECTED BENEFITS

More effective prevention of sprawl.

MONITORING AND ENFORCEMENT

Some land-use tools may require an enforcement component.

TIMETABLE

This Highest Priority action will be initiated by2004.

+++

PRIORITY

Highest Priority. Implementation of this action is considered to be important to achieving the overall intent of Action LND-6.

TIDAL WETLANDS

PRIORITY

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ACTION LND-7

Complete rulemaking and begin implementation of the Recommended New Hampshire Wetland Mitigation Policy for NH DES, prepared by the Audubon Society of NH and the Steering Committee on Wetlands Mitigation.

BACKGROUND

Wetlands mitigation has long been required as a condition of obtaining a state wetlands permit for projects that have significant adverse impact on wetlands, even after efforts to avoid and minimize impacts. Specific mitigation requirements have always been decided on a case-by-case basis, without the guidance of a policy outlined in state wetlands regulations. A state Steering Committee working with the Audubon Society of New Hampshire recently developed a written mitigation guidelines policy. The purpose of this Action is to encourage adoption of the policy into state wetlands regulation. Action LND-24 extends this mitigation policy to coastal area freshwater wetlands.

ACTIONS/ACTIVITIES

1 DES will complete state rulemaking and

2 Begin implementation of the wetlands mitigation policy entitled *A Recommended New Hampshire Wetland Mitigation Policy for NH DES,* developed by the Audubon Society of New Hampshire and the Steering Committee on Wetlands Mitigation. Some of the basic tenets these rules should address are:

- Any negative impact to tidal (as well as freshwater) wetlands function should be mitigated.
- Wetland enhancement and restoration are preferable to wetland creation.
- Acquisition of buffers as mitigation should be considered.
- Cumulative and secondary impacts should be considered in determining the need for mitigation.
- Required mitigation projects should be monitored for completion.

The draft rules will be reviewed by coastal wetland experts, NRCS, the NHEP, NHCP, and contractors prior to adoption into state wetlands regulations.

Fact sheets have already been written to assist permitees with mitigation, and the NHEP should help distribute the fact sheets to communities and contractors, and assist with training workshops.

RESPONSIBLE PARTIES

NH DES Wetlands Bureau will be the lead agency for this action (Steps 1-2), with outreach assistance from the NHCP, NHEP, Audubon and others (Step 2).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

No new costs are anticipated.

FUNDING

NH DES time for this action could come from current mitigation staff (currently 3/5 full-time equivalent and rulemaking staff. Existing NHCP and NHEP staff would provide outreach.

REGULATORY NEEDS

Significant changes to NH DES Administrative Rules for wetlands.

EXPECTED BENEFITS

A more uniform and consistent process for requiring mitigation on state-permitted projects.

MONITORING AND ENFORCEMENT

Existing NH DES Wetlands Bureau staff would enforce the new policy.

TIMETABLE

This High Priority action was initiated in 2001 and will be completed by 2002.

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PRIORITY

High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*. Action-LND 24 extends this action to freshwater wetlands.

TIDAL WETLANDS

PRIORITY +

ACTION LND-8A

Strengthen enforcement and effectiveness of the state tidal buffer zone (TBZ) through outreach to local officials and tidal shoreland property-owners.

BACKGROUND

One of the problems with the state Tidal Buffer Zone law is that few people are familiar with it. Planning boards, code enforcement officers, and conservation commissions need information on the law's requirements. Construction-related activities such as excavation, filling, and new building construction within 100 feet of the "highest observable tide line" (defined as the landward extent of tidal flow, excluding storm events) may be subject to the TBZ regulations. Because so much of the coast is developed, many projects in the TBZ are not noticed by regulators. Effective enforcement of the TBZ law requires vigilance of local conservation commissions and code enforcement officers.

ACTIONS/ACTIVITIES

1. Strengthen the enforcement of the state tidal buffer zone (TBZ) by educating planning boards, code enforcement officers, conservation commissions, and landowners in towns with tidal shoreline about the types locations (within 100 feet of the highest observable tide line) of activities that are subject to the TBZ regulations. Offer workshops or direct presentations and/or training for local officials (NH DES with assistance from other "responsible parties").
2. NH DES staff could also inspect activities in the TBZ via field surveys and/or aerial photographs.

RESPONSIBLE PARTIES

NH DES would be the lead agency for this activity (Steps 1-2), with assistance from NHEP, NHCP, regional planning commissions, and local conservation commissions (Step 1).

IMPLEMENTATION LOCATION

This action may be implemented in all 17 NH coastal communities with tidal frontage.

COSTS

Additional NH DES wetlands staff person at approximately $40,000 (Steps 1-2). Outreach involvement of NHEP and NHCP would be accomplished with existing staff at no additional cost (Step 1).

FUNDING

State funds could be pursued for an additional staff person. Federal programs identified in Tables 10.1 through 10.6 may be sources of funds for specific projects once staff requirements are met.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Improved enforcement of Tidal Buffer Zone regulations to protect salt marshes and other tidal areas.

MONITORING AND ENFORCEMENT

TBZ regulations to be enforced by NH DES staff

TIMETABLE

Initiate by 2007. This Priority action will be pursued as funds and resources become available.

PRIORITY

Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

TIDAL WETLANDS

PRIORITY

+

ACTION LND-8B

Amend state tidal buffer zone (TBZ) regulations to include regulation of deck construction.

BACKGROUND

Under the state Tidal Buffer Zone law, construction-related activities such as excavation, filling, and new building construction within 100 feet of the "highest observable tide line" (defined as the landward extent of tidal flow, excluding storm events) may be subject to TBZ regulations. However, some types of activities in the TBZ are not regulated. Exceptions include landscaping, deck construction, and others. In some situations activities such as deck construction can adversely affect sensitive areas such as salt marshes. A change in NH DES administrative rules for the TBZ would increase the law's effectiveness.

ACTIONS/ACTIVITIES

Pursue and implement changes to NH DES Wetlands Administrative Rules to require a permit for deck construction in the TBZ. The intent of this action is not to prohibit deck construction in the TBZ, but to ensure that salt marshes and other sensitive areas are not adversely affected by such construction. Other changes to simplify and strengthen the TBZ regulations may be desirable, but may require additional statutory authority and additional field staff for NH DES.

RESPONSIBLE PARTIES

NH DES would be the lead agency for this activity.

IMPLEMENTATION LOCATION

This action will be implemented in all 17 NH coastal communities with tidal frontage.

COSTS

Rule changes, to be pursued by existing wetlands staff, would require no additional expense. Implementation of the changes would be greatly enhanced with the additional wetlands staff person at NH DES noted in Action LND-6A.

FUNDING

See Action LND-8A

REGULATORY NEEDS

Changes to NH DES Wetlands Administrative Rules

EXPECTED BENEFITS

Improved protection of salt marshes and other tidal areas.

MONITORING AND ENFORCEMENT

TBZ regulations to be enforced by NH DES staff

TIMETABLE

Initiate be 2007. This Priority action will be pursued as funds and resources become available.

PRIORITY

Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, but would be enhanced by implementation of LND-6A.

TIDAL WETLANDS

PRIORITY
+++

ACTION LND-9A

Reduce the quantity, improve the quality, and regulate the timing of stormwater flow into tidal wetlands through policy changes at the NH DES Wetlands Bureau.

BACKGROUND

Current state wetlands regulations can allow the use of salt marshes as receiving waters for stormwater runoff. The resulting influx of freshwater and/or pollutants can degrade salt marsh functions.

ACTIONS/ACTIVITIES

1. NHCP, with assistance from NH DES, will reduce the quantity, improve the quality, and regulate the timing of stormwater flow from new development into tidal wetlands by changing NH DES policies.

   NH DES policies – and regulations if necessary – should limit the use of salt marshes as receiving waters for stormwater runoff.

2. The guiding concept for the policies and regulation should be that post-development runoff rates and impacts shall not exceed pre-development rates and impacts.

3. NH DES should also implement other policies currently under consideration, such as NHCP's request that wetland permits include conditions requiring the applicant to fix any damage to the salt marsh caused by the stormwater inflow.

4. Regional Planning Commissions will support regulations at the local level could also be encouraged.

RESPONSIBLE PARTIES

State policy change to be accomplished by NHCP staff, with assistance from NH DES (Steps 1-3). Regional planning commissions, with assistance from NHCP, NHEP, and NH DES will encourage local regulatory changes (Step 4).

IMPLEMENTATION LOCATION

This action may be implemented in all 17 NH coastal communities with tidal frontage.

COSTS

No costs for policy changes, as work is to be done by existing staff.

FUNDING

Implementation and monitoring will add to NH DES workload and may require additional funds.

REGULATORY NEEDS

Changes to wetlands administrative rules may be required.

EXPECTED BENEFITS

Reduced damage and degradation of salt marshes.

MONITORING AND ENFORCEMENT

NH DES Wetlands Bureau.

TIMETABLE

This Highest Priority action will be initiated in 2001.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

TIDAL WETLANDS

PRIORITY
+++

ACTION LND-9B

Reduce the quantity, improve the quality, and regulate the timing of stormwater flow into tidal wetlands through changes to the NH DES Site Specific Program.

BACKGROUND

Current Site Specific Program regulations enable the state to require temporary and permanent erosion and stormwater control measures on development sites with land disturbance greater than 100,000 square feet (50,000 square feet in areas subject to the state Comprehensive Shoreland Protection Act). However, developers build some large development projects in a sequential lot-by-lot fashion so impacts are apportioned to individual lots, which can reduce the area disturbed at any one time to below the regulatory threshold. But once completed, the large development can have substantial stormwater impacts on adjacent areas.

ACTIONS/ACTIVITIES

This action calls for a change in the implementation of the Site Specific Program to ensure regulation of all sites with land disturbance greater than 100,000 square feet (50,000 square feet in areas subject to the state Comprehensive Shoreland Protection Act), even when projects employ impact/disturbance partitioning. The goal of this Action is to ensure the Site Specific regulations (stormwater and erosion controls on large developments) are applied as intended.

RESPONSIBLE PARTIES

NH DES would be the lead agency for this action.

IMPLEMENTATION LOCATION

This action may be implemented in all 17 NH coastal communities with tidal frontage.

COSTS

No additional costs, work would be done by existing staff.

REGULATORY NEEDS

Changes to Site Specific administrative rules may be required.

EXPECTED BENEFITS

Improved control of stormwater impacts from large developments.

MONITORING AND ENFORCEMENT

To be accomplished by NH DES Site Specific Program staff.

TIMETABLE

This Highest Priority action is expected to be initiated be 2004.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

TIDAL WETLANDS

PRIORITY

++

ACTION LND-10

Using the Coastal Method and other techniques, identify and restore additional restorable tidal wetlands.

Tidal wetlands are often degraded as a result of land-use decisions such as siting development projects adjacent to tidal wetlands, or constructing roadways that limit tidal flow to and from wetlands. In Chapter 7: Habitat Restoration, Action RST-2 proposes a restoration strategy to address the legacy of land-use decisions that have destroyed or degraded tidal wetlands.

TIDAL WETLANDS

PRIORITY

++

ACTION LND-11

Create a list of potential wetland restoration projects that could be used for wetland mitigation projects, and distribute the list to state agencies and Seacoast municipalities.

Developers whose projects will cause some degree of wetland modification can be required to mitigate the alteration of wetlands by restoring other wetland areas. But local land-use decision-makers may not be aware of wetland restoration opportunities available for mitigation projects. A strategy to facilitate wetland mitigation is proposed in Chapter 7: Habitat Restoration, Action RST-5.

TIDAL WETLANDS

PRIORITY

+++

ACTION LND-12

Pursue restoration funding from the NH DOT, USDA/NRCS, US F&WS, and other sources.

Wetland restoration strategies are expensive. A strategy to secure funding for wetland restoration projects in coastal New Hampshire is proposed in Chapter 7: Habitat Restoration, Action RST-6.

ACTION LND-13

PRIORITY

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SHORELANDS

Provide a framework specific and appropriate to the New Hampshire Seacoast for defining and delineating urban and non-urban shoreland areas.

BACKGROUND

Many of the shoreland protection actions recommended in the *NHEP Management Plan* distinguish urban from non-urban areas – loosely defined as areas which are highly developed versus those that remain relatively undeveloped. But a clear, understandable, consistent, and practical method to determine and apply this distinction is needed.

ACTIONS/ACTIVITIES

Develop a standardized definition of urban and non-urban shoreland areas in the NHEP study area that municipalities can use to delineate these areas. This action might best be accomplished through a working group or project team that includes some local land-use officials, Strafford and Rockingham Planning Commissions, UNH Complex Systems Research Center, NH Office of State Planning, and NH Department of Environmental Services. Existing definitions should be sought and considered first, but new standards may need to be tailored to the conditions and needs of NH Seacoast communities. The resulting definition will be used in outreach efforts outlined in other Action Plans.

RESPONSIBLE PARTIES

The Strafford Regional and Rockingham Planning Commissions with assistance from UNH Complex Systems, NH OSP, and NH DES.

IMPLEMENTATION LOCATION

All of the 43 towns in the Great Bay and coastal watersheds would benefit from the delineation and definitions developed in this action.

COSTS

Estimated cost $5,000.

FUNDING

This action may be funded through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action. Local funds from regional planning commission dues or in-kind contributions toward the project may also be appropriate.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Will allow and support implementation of LND-14.

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

Initiate by 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

++

PRIORITY

High Priority. Implementation of this action is necessary to fully implement Action LND-14.

ACTION LND-14

PRIORITY +++ SHORELANDS

Develop and implement an outreach program to encourage and assist communities in developing and adopting land-use regulations to protect undisturbed shoreland buffers.

ACTIONS/ACTIVITIES

Using the standardized definition for urban and non-urban areas from Action LND-13, increase the use of vegetated buffers of the following widths (with no new impervious surfaces and no cutting of vegetation) around surface waters:

- Non-urban freshwater shorelands: 100 feet or the width of the 100-year floodplain, whichever is more restrictive. Wider buffers should be encouraged for protection of wildlife habitat.
- Urban freshwater shorelands: Sufficient width to ensure no negative water quality impacts. Engineered solutions that produce equivalent water-quality protection are acceptable.
- Non-urban tidal shorelands: 300 feet from high tide as defined by state law or the 100-year floodplain, whichever is more restrictive. (Alternative approaches which produce similar results are acceptable.)
- Urban tidal shorelands: 100 feet from high tide as defined by state law, or an engineered solution that produces equivalent results.

These buffers are intended to supplement, not supersede, the Comprehensive Shoreland Protection Act (CSPA). Where the CSPA requires a 150-foot buffer in which some vegetation cutting can occur, the buffers proposed by this plan prohibit all cutting of vegetation and new impervious surfaces. NH OSP is working on a model ordinance for wetlands and surface waters that will include buffers and provide for requirements that vary depending on the degree of development. The specific buffer requirements in that ordinance may differ from the NHEP recommendations above, but the model ordinance will serve as a starting point and may be a useful substitute.

This Action should involve several steps:

1. Outreach professionals develop a clear rationale for protecting shoreland areas as a means of protecting water quality, habitat, and aesthetic qualities of the estuaries.
2. Develop tools such as model ordinances and land-use regulations, case studies, and illustrations of the benefits of natural buffers over engineered solutions. Pay special attention to simplifying and improving enforcement (outreach professionals).
3. Develop an outreach strategy to distribute these tools and materials and assist local governments in implementing the regulations (the outreach program outlined in Action Plan LND-5 may serve as a useful model) (outreach professionals).

4 Provide a review of regulations and land-use controls (RPCs)

5 Pilot-test the outreach strategy in a selected watershed (Outreach and RPCs)

6 Develop and implement training on the shoreland buffer ordinances for code-enforcement officials (Outreach and RPCs)

7 Create tax-incentive models to encourage buffer protection (OSP)

8 Find ways to identify and eliminate incentives to develop shoreland (OSP)

9 Begin with a pilot project in a single sub-watershed and/or town, and continue as appropriate (Outreach and RPCs)

RESPONSIBLE PARTIES

UNH Cooperative Extension and/or Regional Planning Commissions (RPCs) would be the lead implementers for outreach and training (Steps 1-6); RPCs for code work (Step 9); NH OSP for model ordinances and other tools (Steps 7-8). NROC will incorporate information into its outreach programs.

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds, particularly in communities with less developed shoreline areas.

COSTS

Code work and outreach (per community) in Steps 1-5	$20,000
Training sessions in Step 6	$5,000
Total	**$25,000**

Cost efficiencies would be gained if done in conjunction with sprawl and impervious surfaces Actions.

FUNDING

This action may be funded in part through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action. Local funds from regional planning commission dues or in-kind contributions toward the project may also be appropriate.

REGULATORY NEEDS

Could require changes to local land-use regulations.

EXPECTED BENEFITS

Improved protection of shorelands protects water quality, habitat, and aesthetic quality of the area.

MONITORING AND ENFORCEMENT

Evaluate the number of training sessions held, and the number of communities that incorporate buffers into their land-use regulations.

TIMETABLE

This Highest Priority action will be initiated in 2001.

+++

PRIORITY

Highest Priority. Initial phase of work on rationale and tools is not dependent on implementation of other actions listed in the *NHEP Management Plan*, but completion of Action LND-11 is important to the full implementation of this action.

SHORELANDS

PRIORITY
+++

ACTION LND-15

Support land conservation efforts in shoreland areas.

BACKGROUND

Freshwater and tidal shoreland areas are ecologically important for a number of reasons, including maintenance of water quality and habitat for a variety of wildlife. Many shorelands are also desirable places for development, which threatens the ecological integrity of waterbodies and habitat.

ACTIONS/ACTIVITIES

This action consists of several steps, some of which have already been done:

1. Identify and prioritize appropriate shoreland areas for protection.
2. Promote priorities with traditional land conservation groups.
3. Promote protection by communities by fee simple acquisition and/or easements.
4. Focus NHEP resources on protecting key areas by funding property appraisal and survey costs.

Several recent projects, most notably the Great Bay Resource Protection Partnership and the NHEP Critical Lands Analysis mapping effort, have focused on identifying important coastal watershed lands suitable for protection. These projects provide the information needed to identify and prioritize shoreland areas for protection. The NHEP will encourage conservation groups to include the results of these projects (particularly the NHEP Critical Lands Analysis) in their acquisition priorities.

The NHEP and/or Natural Resources Outreach Coalition will encourage protection of these areas by municipalities in the coastal watershed. The NHEP and/or Natural Resources Outreach Coalition will inform these communities about priority shoreland areas and the value of protecting them. Groups like the NH Wildlife Federation provide presentations on the value of open space and could be included in a larger outreach effort. Where appropriate, the NHEP should focus its funding resources on protection of key areas. This might involve using specific funds for purchases or easements, or for identifying funding sources for communities and/or conservation groups to use to protect specific areas.

This is largely an outreach effort using existing materials. It may also involve some research of funding options by either staff or a contractor.

RESPONSIBLE PARTIES

Land conservation organizations will take lead for promotion of NHEP land conservation goals. Great Bay Resource Protection Partnership (GBRPP), Land and Community Heritage Commission, Natural Resources Outreach Coalition, Strafford and Rockingham County Conservation Districts, Land Conservation Investment Program (LCIP), Land and Water Conservation Fund (LWCF) are responsible for land acquisition or easements.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Cost estimate for outreach efforts in Step 1-3	$15,000
Property survey and appraisal costs in Step 4 (varies with size of property)	$5,000 to $25,000
Acquisition of land and easements:	$millions

FUNDING

Outreach/education and survey and appraisal costs may be funded through US EPA NHEP implementation monies. Federal funds for land or easement acquisition may be available through NOAA and the Great Bay National Estuarine Research Reserve and various USFWS programs that target land acquisition for coastal habitat protection, and the USDA/NRCS Farmland Protection Program. State and local funds will play an important role in providing non-federal match, or the background research and legal work required for land or easement acquisition.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Increased acreage of protected shoreland would secure long-term protection of water quality, habitat, and aesthetic and other values.

MONITORING AND ENFORCEMENT

Evaluation by acreage of target areas protected.

TIMETABLE

This Highest Priority action will be initiated in 2001. It will also be emphasized through LND-27 which will be implemented in 2001-2002.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

SHORELANDS

PRIORITY +++

ACTION LND-16

Improve enforcement of the state Comprehensive Shoreland Protection Act and other applicable shoreland protection policies through outreach efforts to local officials and shoreland property owners.

BACKGROUND

The effectiveness of the state Comprehensive Shoreland Protection Act (CSPA) is limited primarily by lack of thorough and consistent enforcement.

ACTIONS/ACTIVITIES

Develop an outreach program for code enforcement officers and building inspectors on the importance of the CSPA and other shoreland protection policies. NH DES will shift some of their education efforts toward these local officials, bringing outreach programs directly to the communities instead of through regional or statewide workshops. NH DES will include training in shoreland protection requirements and state resources available to assist in enforcement. Efforts might include support for increased outreach by NH DES to shoreland property-owners, both to improve compliance and to spur the awareness of abutters. The state should consider a toll-free phone number for the public to report violations.

This project should be conducted throughout the coastal watershed, starting with the 17 towns with tidal shoreline. The state Shoreland Protection Program's outreach and enforcement staff should coordinate with coastal outreach efforts, including the Natural Resources Outreach Coalition and the NH Coastal Program.

RESPONSIBLE PARTIES

NH DES Shoreland Protection Program would be the lead implementer of this action with assistance from the Natural Resources Outreach Coalition.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds wherever the CSPA applies, starting with the 17 towns with tidal shoreline.

COSTS

Workshops for towns	$0
Outreach material and regional workshop	$5000
Total	**$5000**

FUNDING

US EPA NHEP implementation funds will be used in 2001-2002 with in-kind staff support from NH DES Shoreland Protection Program.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Improved enforcement of the state CSPA would protect water quality, habitat, and aesthetic values.

MONITORING AND ENFORCEMENT

Evaluate by the number of training sessions held.

TIMETABLE

This Highest Priority action will be implemented in 2001-2002.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

SHORELANDS

PRIORITY

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ACTION LND-17

Provide incentives for the relocation of grandfathered shoreland uses.

BACKGROUND

A considerable amount of shoreland development was in existence before enactment of the state Comprehensive Shoreland Protection Act (CSPA), and was exempted from the statute's requirements. Yet these sites often contribute significantly to water quality and habitat degradation. Targeting incentives to relocate these grandfathered uses could substantially improve the estuaries and other waterbodies to which the CSPA applies.

ACTIONS/ACTIVITIES

1 Study options for incentives to remove grandfathered uses that adversely affect waters subject to the CSPA (e.g., tax or regulatory relief, financial incentives, etc.).

2 Use the information gained to develop an implementation strategy. Where local government is involved, this Action could be coordinated with other planning outreach efforts in the *NHEP Management Plan*. This effort should focus on shoreland areas in the Great Bay and coastal watershed.

Step 1 involves researching and compiling incentive options. Step 2 involves working with individual municipalities to identify sites and develop a strategy for contacting the owners. This might best be done in conjunction with the sub-watershed pilot approach of the sprawl and impervious surfaces efforts of Action LND-1, et al. The municipalities would follow through, with assistance from NHEP or the Regional Planning Commissions.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as the Strafford Regional and Rockingham Planning Commissions as well as NH OSP to discuss the work plan level detail associated with this action prior to its implementation.

IMPLEMENTATION LOCATION

This action may be implemented at grandfathered shoreland sites throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Research in Step 1	$5000
Implementation in Step 2	$5000
Total	**$10,000**

FUNDING

This action may be funded in part through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP will also support this action. Local funds from regional planning commission dues or in-kind contributions toward the project may also be appropriate.

REGULATORY NEEDS

None identified

EXPECTED BENEFITS

Improved condition, water quality, and habitat functioning of important shoreland areas.

MONITORING AND ENFORCEMENT

Evaluate on the number of grandfathered uses relocated.

TIMETABLE

Initiate by 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

PRIORITY

++

High Priority. While implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, it could be implemented in conjunction with Actions LND-1, LND-2, et al.

GROUND-WATER

PRIORITY
+++

ACTION LND-18

Locate and quantify quantity and quality of groundwater inflow to the estuaries.

BACKGROUND

The quality of surface waters flowing into the state's estuaries receives considerable attention, but little is known about the impact of groundwater quality on the estuaries. Such knowledge could contribute to better management of the state's estuarine resources.

ACTIONS/ACTIVITIES

UNH/NOAA Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) is funding a three-year study of "Inflow and Loadings from Groundwater to the Great Bay Estuary." Study objectives are to:

- Quantify the characteristics of groundwater flows to Great Bay;
- Assess groundwater chemical loads to Great Bay;
- Integrate the information gathered with the groundwater data requirements of the ongoing Estuarine Contaminant Status and Forecasting System (ECOSTAFS) project, and propose a model that best represents the groundwater processes and will work with ECOSTAFS; and
- Assess the impact of water resource use and land uses on groundwater freshwater discharges to the estuary. This project focuses on the Great Bay area, however the methodology could likely be extended to other coastal NH areas.

The project uses analysis of water samples, remote sensing based on public domain and classified intelligence imagery, thermal infrared imaging, potentiometric measurement of groundwater flow in existing and newly drilled wells (located using military grade Global Positioning Systems), isotopic age-dating of water samples, and synthesis of a conceptual model to describe the link between groundwater flow and surface waters.

This project should be duplicated in Hampton-Seabrook Harbor.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as UNH Civil Engineering Department, US Geological Survey, NH DES, Great Bay National Estuarine Research Reserve, UNH Jackson Estuarine Laboratory, and UNH/CICEET to discuss the work plan level detail associated with this action prior to its implementation.

COSTS

CICEET has already funded the Great Bay Study at $299,876.
Estimated $20,000 cost for extension to the Hampton-Seabrook Estuary, to be funded by NHEP.

FUNDING

This action may be funded in part through US EPA NHEP implementation funds, or through other federal programs identified in Tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Greater understanding of the effect of groundwater quality and quantity on the state's estuarine systems.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

This Highest Priority action will be initiated by 2004.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

GROUND-WATER

PRIORITY

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ACTION LND-19

Locate, reduce, or eliminate – and also prevent – groundwater contaminants.

ACTIONS/ACTIVITIES

This action could be approached in two different ways.

1a One option is to wait for completion of Action LND-18 to identify potentially sensitive areas with respect to land use and preferential pathways for contaminants. Contaminant elimination work would then be focused on those sensitive areas.

1b The second option is to begin with a review and summary of existing information. The NH DES Waste Management Division and Source Water Protection Program could provide site assessments for contaminated sites, and lists of potential sources of contaminants within 4,000 feet of wellheads. NH DES's proposed Public Water Supply Land Conservation Program could help identify Source Water Protection Areas in the coastal watershed.

Preventing contamination should also be emphasized, especially in particularly sensitive areas (e.g., aquifers), as well as locating and eliminating sources of groundwater contamination. Prevention strategies could include stricter land-use controls, and land conservation measures.

2 Knowledge gained from these studies will be communicated to the public with outreach programs on groundwater issues. Outreach programs would include education to ensure compliance with groundwater protection BMPs. This may require adoption of a groundwater protection ordinance and/or changes in zoning regulations by municipalities.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers, such as NH DES, coastal watershed municipalities, NHEP outreach, and Natural Resources Outreach Coalition, to discuss the work plan level detail for this action prior to implementation.

COSTS

Three months' time for a summer intern (Step 1a or 1b)	$4,000
0.1 full-time equivalent for education and compliance work at NH DES (Step 2)	$5,000
Total	**$9000**

FUNDING

This action may be funded in part through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action.

REGULATORY NEEDS

Prevention work may require some changes to local land-use regulations.

EXPECTED BENEFITS

Improved protection and quality of groundwater.

MONITORING AND ENFORCEMENT

Expected to be a joint state and local effort.

TIMETABLE

Initiate by 2004.

PRIORITY

Highest Priority. Implementation of this Action is not dependent on implementation of other actions listed in the *Management Plan*, although information gained from Action LND-18 would be useful in targeting pollution elimination efforts to the most sensitive areas.

FRESHWATER WETLANDS

PRIORITY

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ACTION LND-20

Develop and implement a wetlands buffer outreach program for Planning Boards.

BACKGROUND

Buffers around wetlands give a greater level of protection to wetland value and function. Several state agencies and conservation organizations recently completed Buffers for Wetlands and Surface Waters: A Guidebook for N.H. Municipalities, to provide scientific justification and techniques for protecting and enhancing wetland buffers.

ACTIONS/ACTIVITIES

1. Update and focus existing buffer programs for use in the coastal area.
2. Distribute the buffer guide for municipalities.
3. Create a series of zoning regulation models for use by all towns in the coastal watershed.

RESPONSIBLE PARTIES

NHEP Outreach, UNH Cooperative Extension, NH OSP, USDA/NRCS, and Audubon Society of New Hampshire (Steps 1-2); Strafford and Rockingham Regional Planning Commissions (Step 3).

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

$12,000 for Steps 1-3.

FUNDING

This action may be funded in part through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Enhanced protection of buffers around wetlands, resulting in greater protection of wetland function, water quality, and habitat.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

Initiate by 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

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PRIORITY

High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

FRESHWATER WETLANDS

PRIORITY

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ACTION LND-21

Prevent the introduction of untreated stormwater to freshwater wetlands by enacting legislation giving NH DES authority to regulate stormwater discharge to wetlands.

BACKGROUND

The NH DES currently has authority to regulate dredge and fill in wetlands for the purpose of protecting the values and functions that wetlands provide. However, the introduction of stormwater to wetlands is not regulated. Large volumes of stormwater and the contaminants it typically carries can degrade the wetland functions that state law is intended to protect.

ACTIONS/ACTIVITIES

Pursue legislation to give NH DES statewide authority to prevent wetlands degradation from introduction of stormwater. Regulation of meltwater from snow piles and dumps should also be considered in developing this legislation.

RESPONSIBLE PARTIES

NH DES can be the lead implementer of this action.

IMPLEMENTATION LOCATION

This action will be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

None anticipated - to be accomplished by existing NH DES staff.

REGULATORY NEEDS

Change in statute and/or administrative rules.

EXPECTED BENEFITS

Enhanced protection of wetland function.

MONITORING AND ENFORCEMENT

To be accomplished with existing NH DES staff.

TIMETABLE

Initiate be 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

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PRIORITY

High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

ACTION LND-22

Prevent the introduction of untreated stormwater to wetlands by strengthening municipal site plan review regulations.

PRIORITY

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FRESHWATER WETLANDS

BACKGROUND

Local officials play a key role in land-use decisions. Some development projects can degrade wetlands through introduction of untreated stormwater. Such degradation can be avoided by requiring stormwater management provisions in local land-use regulations.

ACTIONS/ACTIVITIES

1. Develop site plan review regulations for coastal watershed municipalities to protect wetlands from stormwater degradation.
2. Conduct outreach to municipal boards
3. Implement new regulations locally

RESPONSIBLE PARTIES

Regional Planning Commissions will lead development of model regulations (Steps 1-3); Natural Resources Outreach Coalition will assume the lead for outreach (Step 2); municipal planning boards will implement site plan review regulations (Step 3).

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds..

COSTS

$5,000 to draft new site plan review regulations. No additional costs for outreach and assistance to communities, as this can be worked into existing educational efforts.

FUNDING

This action may be funded in part through US EPA NHEP implementation funds, or through other federal programs identified in Tables 10.1-10.6 in the *NHEP Management Plan*. State funds available through natural resource management agencies such as NH DES and NH OSP could also support this action.

REGULATORY NEEDS

Changes to local land use regulations.

EXPECTED BENEFITS

Enhanced protection of wetland function.

MONITORING AND ENFORCEMENT

To be accomplished through local land-use regulation.

TIMETABLE

Initiate by 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

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PRIORITY

High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

ACTION LND-23

Prevent the introduction of untreated stormwater to wetlands through an increased understanding of stormwater impacts on wetland ecology.

PRIORITY

FRESHWATER WETLANDS

BACKGROUND

Much research has been conducted on the value and function of wetlands. However, better understanding of the impacts of human activities on wetlands – such as how the quantity and quality of stormwater introduced to wetlands affect the wetlands and the wildlife that use them – would contribute to developing more effective stormwater management regulations.

ACTIONS/ACTIVITIES

Develop a research project to increase our understanding of wetlands and the impacts associated with the introduction of stormwater, focusing on the towns closest to tidal waters.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as UNH, NH Association of Wetland Scientists, and the Audubon Society of New Hampshire to discuss the work plan level detail associated with this action prior to its implementation.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Research project	$200,000

FUNDING

This action may be funded in small part through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Greater understanding of wetlands and the effects of stormwater introduced to wetlands, leading to more effective management of stormwater impacts on wetlands.

MONITORING AND ENFORCEMENT

None identified.

TIMETABLE

Initiate by 2007. This Priority action will be pursued as funds and resources become available.

PRIORITY

Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

ACTION LND-24

Work with NH DES to encourage adoption of a state wetlands mitigation policy.

PRIORITY

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FRESHWATER WETLANDS

Action LND-7 presents a complete development of this action in the context of tidal wetlands. Provisions for freshwater wetlands are also presented in the "Recommended New Hampshire Wetland Mitigation Policy" cited in Action LND-7. This action, LND-24, seeks to include coastal area freshwater wetlands in state rulemaking and wetlands mitigation policy implementation.

FRESHWATER WETLANDS

PRIORITY

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ACTION LND-25

Encourage municipal designation of Prime Wetlands and 100-foot buffers or equivalent protection.

BACKGROUND

Designation of non-tidal Prime Wetlands (or equivalent protection) provides additional protection to wetlands of exceptional value through the state wetlands permitting process.

ACTIONS/ACTIVITIES

Assist communities through a series of steps (LND-25A - 25D) in designating Prime Wetlands, or in developing other means of giving enhanced protection to exemplary wetlands.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as NH OSP, NH DES, the Strafford Regional and Rockingham Planning Commissions, and the Audubon Society of New Hampshire to discuss the work plan level detail associated with this action prior to its implementation.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Total cost for full implementation of Actions 25A-25D in one town is estimated at $35,000, but will vary on a town by town basis depending on the amount of existing information, availability of volunteers, etc.

TIMETABLE

Initiate by 2005 (LND-25B will be initiated by 2004).

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PRIORITY

High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

ACTION LND-25A

Create a traveling Prime Wetlands display.

PRIORITY

FRESHWATER WETLANDS

BACKGROUND

Few coastal watershed communities have elected to pursue Prime Wetlands designation. This Action Plan is designed to educate local officials and the public about the purpose and benefits of Prime Wetland designation.

ACTIONS/ACTIVITIES

Develop a traveling display and public presentation for coastal watershed communities to increase public understanding and appreciation of Prime Wetlands.

RESPONSIBLE PARTIES

Audubon Society of New Hampshire will be the lead implementer with assistance from NHEP and NH DES Wetlands Bureau.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Static display $750; public presentation per town approximately $200/town.

FUNDING

US EPA NHEP implementation funds or NH Coastal Program grants program funds could be used to implement this Action.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Improved understanding of the Prime Wetlands designation process.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

Initiate be 2007.

PRIORITY

Priority. Implementation of this action is not considered to be important to achieving the overall intent of Action LND-25.

FRESHWATER WETLANDS

PRIORITY +++

ACTION LND-25B

Provide training and project assistance for towns interested in utilizing the Method for the Comparative Evaluation of Non-tidal Wetlands in New Hampshire.

BACKGROUND

The first step in designating non-tidal Prime Wetlands is evaluating the value and function of some or all wetlands in a town, in order to identify exemplary wetlands. The NH Method is a comparative wetland evaluation method designed for this task.

ACTIONS/ACTIVITIES

Provide technical assistance to all coastal watershed towns in conducting wetland evaluations to identify exemplary wetlands.

RESPONSIBLE PARTIES

Audubon Society of New Hampshire as lead, with assistance from Regional Planning Commissions, USDA Natural Resources Conservation Service, Strafford and Rockingham County Conservation Districts, and the UNH Complex Systems Research Center and students.

IMPLEMENTATION LOCATION

This action may be implemented wherever non-tidal wetlands occur throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

$5,000 to $12,000/town depending on volunteer and/or student involvement.

FUNDING

This project may be funded with federal US EPA-NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 of this document.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Better understanding of the value and function of particular wetlands, and increased likelihood of some of them receiving greater protection.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

This Highest Priority action will be initiated be 2004.

+++

PRIORITY

Highest Priority. Implementation of this action is considered to be important to achieving the overall intent of Action LND-25.

ACTION LND-25C

Work with local planning boards and conservation commissions on regulatory approaches to wetlands conservation.

PRIORITY

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FRESHWATER WETLANDS

BACKGROUND

Local land-use officials play an important role in protecting wetlands in many ways, including incorporating wetland protection into local ordinances, and commenting on wetland projects being considered for state permits. Certain local wetland protection measures are often more strict than state protection (e.g., local requirements for buffers around freshwater wetlands).

ACTIONS/ACTIVITIES

1. Provide local planning boards with community land-use regulation options for protecting wetland values (RPCs and NROC)
2. Audubon Society of NH will provide training to conservation commissions on how to work with state wetland permit applicants prior to formal application, to minimize wetland impacts of proposed projects on wetlands.

RESPONSIBLE PARTIES

Regional Planning Commissions and the Natural Resources Outreach Coalition (Step 1). Audubon Society of New Hampshire and NH DES Wetlands Bureau may provide conservation commission training (Step 2).

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

$8,000 - $10,000 for Steps 1 and 2.

FUNDING

This action may be funded through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. The NH Coastal Program and NH DES may be sources of additional funding.

REGULATORY NEEDS

None identified, but implementation of the action could lead to changes in local land-use regulations.

EXPECTED BENEFITS

Greater protection of wetland value and function.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

Initiate in 2005.

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PRIORITY

High Priority. Implementation of this action is considered to be moderately important to achieving the overall intent of Action LND-25.

ACTION LND-25D

Create and/or enhance local land conservation programs with emphasis on high-value wetlands and buffers.

PRIORITY

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FRESHWATER WETLANDS

ACTIONS/ACTIVITIES

After undertaking a wetlands evaluation project as outlined in Action LND-25B, train coastal watershed conservation commissions and local land trusts in land conservation techniques. Involve regional and/or statewide land conservation experts in the effort.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as Conservation Commissions, Local Land Trusts, Great Bay Resource Protection Partnership, Strafford and Rockingham County Conservation Districts, and Society for Protection of New Hampshire Forests, to discuss the work plan level detail associated with this Action prior to its implementation.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

$12,000.

FUNDING

This action may be funded through US EPA NHEP implementation funds, or through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Enhanced capacity for land conservation.

MONITORING AND ENFORCEMENT

No requirements identified.

TIMETABLE

Initiate by 2005.

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PRIORITY

High Priority. Implementation of this action is considered to be moderately important to achieving the overall intent of Action LND-25.

HABITAT PROTECTION

PRIORITY
+++

ACTION LND-26

Support implementation of state and federal land protection programs (e.g., Conservation and Reinvestment Act, Land and Community Heritage, Teaming With Wildlife, Land and Water Conservation Fund, Coastal Initiative Program, Farmland Protection Program).

BACKGROUND

Loss and alteration of wildlife habitats is recognized as one of the greatest threats to New Hampshire's environment. Habitat loss and alteration is especially problematic in New Hampshire's Seacoast region. Annual loss of forest land to development over the last 30 years is estimated at 1,000 and 3,000 acres (.2 and .5%) in Strafford and Rockingham counties respectively, totaling approximately 15%.

One way to protect habitat is to increase the amount of permanently protected conservation lands in the region. This requires a stable funding source that will allow governments and environmental organizations to purchase ecologically important lands, or conservation easements on such lands, from willing sellers. The New Hampshire Land and Community Heritage Program is considering options to create a permanent source of state funding to leverage federal and private funds for protection of both natural and cultural resources important from a state, regional, or community perspective.

The U.S. Congress is considering programs to fund land protection and other environmental projects. If adopted, the Conservation and Reinvestment Act of 1999 could provide significant financial resources to natural resource research and protection in the coming years through three programs:

- Teaming With Wildlife would help fund projects to increase our understanding of nongame wildlife and to assist in the purchase of important habitat areas;
- The Land and Water Conservation Program would also help the state and municipalities purchase lands for recreation and natural resource preservation;
- The Coastal Initiative Program could provide funds to use for natural resource protection in the coastal zone.

ACTIONS/ACTIVITIES

1. Develop a slide show and displays to inform New Hampshire citizens about the opportunities the proposed programs would offer, and to encourage support and involvement.
2. Display the developed materials at appropriate locations (e.g., libraries, town halls, Sandy Point Center, Seacoast Science Center, etc.) throughout the New Hampshire Seacoast.
3. Educate citizens interested in habitat protection and land conservation.

RESPONSIBLE PARTIES

The New Hampshire Citizens for Land and Community Heritage would act as lead implementer with assistance from environmental, cultural and historical non-profit organizations (Steps 1-6); Strafford and Rockingham County Conservation Districts; the New Hampshire Coastal Program; New Hampshire Fish and Game Department; New Hampshire Department of Resources and Economic Development; and New Hampshire Department of Environmental Services, UNH Cooperative Extension (Steps 5-6).

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Program development in Step 1	$5,000
Program scheduling and presentation in Step 1 and 2	$5,000
Total	**$10,000**

FUNDING

Funding to support the NH Citizens for Land and Community Heritage was secured from various sources during 1990-2000. Additional monies may be available through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*. Other possible funding sources would include private foundations.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

- Permanent protection of important historical, cultural and natural sites.
- Involvement of local communities in protecting resources.

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

NHEP will monitor ongoing activities of LCHIP and initiate additional activities as necessary by 2004.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

HABITAT PROTECTION

PRIORITY

+++

ACTION LND-27

Support the efforts of the Great Bay Resource Protection Partnership.

BACKGROUND

The Great Bay Partnership was formed in 1994 by federal and state agencies and the four largest statewide environmental organizations with a goal of protecting important wildlife habits in the Great Bay and coastal areas of New Hampshire. The Partnership has completed a detailed regional habitat analysis and developed a list of priority areas for protection. Land protection work has begun in towns around the Great Bay with funds from the North American Wetland Conservation Fund and the National Oceanic and Atmospheric Administration (through the Great Bay National Estuarine Research Reserve).

The Partnership's efforts are coordinated by a part-time staff person working in the Seacoast. This person facilitates communication between partners and with local land trusts and municipal governments, as well as managing special projects that improve land protection and management activities in the region.

The Partnership plans to continue to support biodiversity by seeking funds from a variety of sources, and working on protecting and managing lands in priority areas.

ACTIONS/ACTIVITIES

1. State agencies, UNH Cooperative Extension and Audubon Society of New Hampshire provide assistance to municipalities in completing three community-based habitat assessments per year to provide the Partnership with increased habitat value information.
2. State agencies assist Partnership in securing funding to maintain a coastal staff coordinator.
3. Local land trusts and conservation commissions work in their respective focus areas in cooperation with the Partnership to increase their success rate.

RESPONSIBLE PARTIES

The New Hampshire Fish and Game Department, with the Great Bay National Estuarine Research Reserve that hosts the Great Bay Partnership, is the agency administrator (Step 2). Other groups supporting the Great Bay Resource Protection Partnership are: Regional Land Trusts, local Conservation Commissions, UNH Cooperative Extension (Step 1), Audubon Society of New Hampshire (Step 1), New Hampshire Estuaries Project, and New Hampshire Coastal Program (Steps 1, 3).

IMPLEMENTATION LOCATION

This action may be implemented throughout the Great Bay watershed.

COSTS

Community Habitat Assessment in Step 1	
$8,000/town for 3 towns per year	$24,000
Partnership Coordinator Position per year	$25,000
Total	**49,000**

FUNDING

This action will be funded with US EPA-NHEP implementation funds in 2001-2002. Funding sources for protection of conservation lands include current member organizations of the Great Bay Resource Protection Partnership.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

- Increased acreage of permanently protected conservation lands.
- Increased understanding of habitat values in NHEP focus area.
- Greater cooperation among land protection agencies and organizations.
- Greater protection of New Hampshire's biodiversity and important habitats

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

This Highest Priority action will be implemented in 2001-2002.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, though it is related to Actions LND-13 and LND-36.

HABITAT PROTECTION

PRIORITY
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ACTION LND-28

Encourage towns to dedicate current-use change tax penalties to conservation commissions for the purpose of natural resource acquisition, easements, restoration, and conservation land management.

BACKGROUND

The current use program was created by state law (RSA 79-C) to encourage the preservation of open space by providing tax incentives to landowners. If a landowner removes his or her property from the current-use program the owner must pay a penalty tax to the local tax collector based on the time the property has been in the program. The statute allows the municipality to use all or a portion of these funds for land conservation. Town meeting or city council must approve this provision of the statute for it to take effect in a municipality.

Conservation commissions can use these current-use change tax penalties to help establish a fund for local land conservation that is directly related to the land development pressures in their community. As more properties are removed from the current-use tax program and converted to other uses, the money available for conservation will increase as the need to protect open space becomes more critical.

Most government land protection funding programs require a local match. Having these funds available for land conservation gives municipalities leverage to seek those governmental funds.

ACTIONS/ACTIVITIES

1. Develop materials and inform municipal officials about the use of the current-use change penalty for land conservation. Include the reasons to dedicate current-use change penalty funds for conservation, such as the positive impacts of open space on municipal budgets. Materials should be designed to encourage all towns to set up a current-use change penalty fund in their budgets dedicated to conservation-related activities.
2. Develop and implement an outreach strategy to reach all Seacoast region communities with information on this provision for Current-Use change tax funds.
3. Create a model warrant article for town meeting approval.

RESPONSIBLE PARTIES

The New Hampshire Association of Conservation Commissions could act as the lead implementer (Steps 1-3), with assistance from the NH Wildlife Federation, New Hampshire Estuaries Program, UNH Cooperative Extension, Strafford and Rockingham County Conservation Districts, Great Bay Resource Protection Partnership, and the New Hampshire Coastal Program (Steps 1-3).

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Development of outreach materials in Step 1	$4,500
Community outreach in Step 2	$20,000
Model warrant article in Step 3	no cost
Total	**$24,500**

FUNDING

The NHEP has allocated $24,500 of its current implementation funds for this project. Additional money may be available through other federal programs identified in tables 10.1 to 10.6 in the *NHEP Management Plan*.

REGULATORY NEEDS

None required.

EXPECTED BENEFITS

- Additional funding for local land protection efforts.
- Protection of additional land to support New Hampshire's biodiversity.
- Recreation opportunities and open space for community enjoyment.

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

This Highest Priority action will be initiated by 2004.

+++

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

HABITAT PROTECTION

PRIORITY

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ACTION LND-29

Provide technical assistance in land protection and management to regional land trusts and municipal conservation commissions.

BACKGROUND

Conservation lands should be managed to maximize their capacity to support natural biodiversity in the coastal region, whether owned and managed by federal to town governments or other agencies or organizations.

A number of federal, state, and private groups with land protection expertise could assist others involved in land protection. A new land management system must be developed to help implement the goals of the New Hampshire Ecological Reserve System (ERS) Project, a public-private program to enhance ecological conservation in the state. This will help manage lands for support of the great diversity of plants and animals in this area of expanding human population and development.

ACTIONS/ACTIVITIES

1. Develop management guidelines and incentives for land trusts to engage in supporting the goals of the New Hampshire Ecological Reserve System Project.
2. Develop program to assure local land trusts and conservation commissions have access to land protection, management, and monitoring expertise, to help them protect and manage lands for biodiversity.
3. Use the Ecological Reserve System selection and design criteria to evaluate conservation and non-conservation lands for biodiversity features in collaboration with interested landowners.
4. Work with academic institutions to evaluate the impacts of land-use changes on environmental quality and the capacity to conserve the region's biodiversity.

RESPONSIBLE PARTIES

The New Hampshire Ecological Reserves Project will act as the lead implementer of this action (Steps 1-4), with assistance from New Hampshire Fish and Game Department, New Hampshire Chapter of The Nature Conservancy, Audubon Society of New Hampshire, Strafford and Rockingham County Conservation Districts, NH Department of Resources and Economic Development Division of Forest and Lands, Great Bay Resource Protection Partnership, Society for the Protection of New Hampshire Forests, UNH Cooperative Extension, University of New Hampshire, US Environmental Protection Agency, US Fish and Wildlife Service, and USDA Natural Resources Conservation Service.

IMPLEMENTATION LOCATION

This action may be implemented throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Guidelines and incentives for land trusts in Step 1	$10,000
Technical assistance to land trusts in Step 2	$15,000
Screen lands using Ecological Reserve System criteria (5 lands/yr) in Step 3	$10,000
Management and development of public use guidelines in Step 3	$15,000
Land use impact research in Step 4	$25,000
Total	**$75,000**

FUNDING

Possible funding sources include: EPA sustainability grant, private foundations, US Fish and Wildlife's Teaming With Wildlife, New Hampshire Coastal Program grant program, New Hampshire Estuaries Project, and New Hampshire Fish and Game Department

REGULATORY NEEDS

None required.

EXPECTED BENEFITS

- More effective local and regional land protection and management projects.
- Management of lands to support biodiversity.

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

Step 1 initiated in 2001 by ERS. Steps 2-3 initiated by 2005.

PRIORITY

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High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

HABITAT PROTECTION

PRIORITY

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ACTION LND-30

Develop and encourage use of biomonitoring standards to evaluate water quality.

BACKGROUND

The quality of the surface waters in the coastal region directly affects the ability of those waters to support the full array of wetland, aquatic, and estuarine species that rely on them. Much work has been done over the last 30 years to improve the quality of these waters. Much monitoring done to assess and track water quality trends looks at physical and chemical properties of water, including measuring the presence of nutrients, chemicals, and suspended particles in the water.

To gain a better perspective on the habitat values of surface waters, we need to look at the biological component in our waters as well as the physical and chemical. Biological monitoring is currently used in many places including some in New Hampshire. Gaining knowledge of the invertebrates and vertebrates present in water will help us learn more about the impact of chemical and physical changes on living things. It will provide an additional way to measure the impact of water quality on habitat, and a basis for recommending changes to improve the habitat value of these waters.

ACTIONS/ACTIVITIES

1. Investigate active biomonitoring programs in the Northeast.
2. Develop biomonitoring standards for the New Hampshire coastal region. Develop standards for use in the freshwater environments of coastal New Hampshire watersheds, which involves three general tasks:
   - Collect data across the state to develop biomonitoring standards (this activity is currently being done by NH DES).
   - Develop a stream classification system largely based on stream morphological characteristics.
   - Develop biomonitoring standards based on the adopted stream classification system.
3. Incorporate standards into existing water-quality monitoring programs.

RESPONSIBLE PARTIES

The NH Department of Environmental Services will be lead implementer of this action (Steps 1-3)

IMPLEMENTATION LOCATION

The information and standards developed in this action could be applied to surface waters throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Existing NH DES staff and resources can accomplish most of these tasks (Steps 1-3), although the development of criteria would be substantially boosted through the collection of data as outlined in Action LND-3.

REGULATORY NEEDS

Possible changes to NH DES statutes and/or administrative rules relative to stream classification standards.

EXPECTED BENEFITS

New and more accurate methods to assess stream condition.

MONITORING AND ENFORCEMENT

To be accomplished by NH DES.

TIMETABLE

Initiate be 2005. Opportunities to implement this High Priority action will be pursued in the next four years as funds and resources become available.

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PRIORITY

High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, but would be substantially enhanced through the completion of Action LND-3.

HABITAT PROTECTION

PRIORITY

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ACTION LND-31

Use results of biomonitoring and water quality monitoring to prioritize watershed areas for protection and remediation.

BACKGROUND

Developed and adopted biomonitoring criteria (see Action LND-30) are useful for a wide range of purposes including evaluating overall health of a particular watershed, identifying specific stream reaches in need of strengthened enforcement of environmental laws, and identifying specific areas needing restoration.

ACTIONS/ACTIVITIES

1. As Action LND-30 nears completion, NH DES develops a plan for evaluating coastal NH watersheds, which is expected to take one to two years to complete.
2. Use the biomonitoring standards developed in Action LND-30 to evaluate the overall health and ecological integrity of coastal NH watersheds and streams.
3. Use the information gained to help identify and prioritize watershed areas for protection and remediation efforts.

RESPONSIBLE PARTIES

The NH Department of Environmental Services would be lead implementer of this action (Steps 1-3).

IMPLEMENTATION LOCATION

Biomonitoring standards could be applied throughout the 43 towns in the Great Bay and coastal watersheds.

COSTS

Two full-time staff (salary, benefits, supplies, etc.) at NH DES in Steps 1-3	$120,000
Two summer interns in Step 2	$6,000
Total	**$126,000**

FUNDING

Some or all of these costs could be absorbed by the current NH DES Biomonitoring Program. Additional monies might be secured through US EPA NHEP implementation funds or through other federal programs identified in tables 10.1 to 10.5 in the *NHEP Management Plan*. State funds available through other natural resource management agencies such as NH OSP will also support this action.

REGULATORY NEEDS

None identified.

EXPECTED BENEFITS

Greater understanding of the environmental quality of coastal NH watersheds.

MONITORING AND ENFORCEMENT

To be accomplished by NH DES.

TIMETABLE

Initiation to follow LND-30.

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PRIORITY

High Priority. Implementation of this action is dependent on the completion of Action LND-30 of the *NHEP Management Plan*.

HABITAT PROTECTION

PRIORITY +++

ACTION LND-32

Encourage municipalities to incorporate wildlife habitat protection into local master plans by promoting NH Fish and Game's *Identifying and Protecting Significant Wildlife Habitat: A Guide for Towns,* and other activities.

BACKGROUND

Local land-use officials are in a position to guide future development and protect wildlife habitat in their towns. A regional habitat evaluation has been completed by the Great Bay Resource Protection Partnership, but more information specific to each town or city would be useful in developing or revising local master plans. The first step is community-based habitat evaluations to identify and prioritize significant habitats that should be recognized in master plans. The new publication Identifying and Protecting Significant Wildlife Habitat: A Guide for Towns (a.k.a., Community Habitat Manual), from the New Hampshire Fish and Game Department's Nongame and Endangered Species Program, will provide guidance to local conservation commissions and planning boards in identifying and prioritizing habitat. Community-specific wildlife information will strengthen a town's ability to address habitat protection and balance this need with growth.

ACTIONS/ACTIVITIES

1. Prioritize municipalities for application of the Community Habitat Manual based on community interest.
2. Provide technical assistance to coastal watershed communities in evaluating and prioritizing wildlife habitats.
3. Develop model wildlife habitat format for local master plans.
4. Develop and implement training programs for planning boards, conservation commissions and regional planners in using the Community Habitat Manual.

RESPONSIBLE PARTIES

The New Hampshire Fish and Game Department (Steps 1-2) and Strafford Regional and Rockingham Planning Commissions (Steps 3-4) would be lead implementers of this action, with assistance from UNH Cooperative Extension, New Hampshire Coastal Program, Audubon Society of New Hampshire, and Natural Resources Outreach Coalition.

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

Municipal Prioritization in Step 1	No cost
Master Plan Habitat Model in Step 2	$2,500
Training Program in Step 4	$8,000
Total	**$10,500**
Technical Assistance in Step 2	$4,000/municipality

FUNDING

Possible funding sources include: New Hampshire Estuaries Project, New Hampshire Coastal Program Grant Program, US Fish and Wildlife's Teaming With Wildlife, and private foundations.

REGULATORY NEEDS

None required.

EXPECTED BENEFITS

- Identification of significant local wildlife habitats.
- Increased awareness and understanding of wildlife habitat identification and value by local and regional officials and citizens.
- Recognition of wildlife habitat as an important feature to be integrated into local planning decisions

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

This Highest Priority action will be initiated by 2004.

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PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

HABITAT PROTECTION

PRIORITY +++

ACTION LND-33

Develop a model local planning approach to encourage the identification and maintenance of contiguous habitat blocks.

BACKGROUND

Human use and development of land breaks the contiguous expanses of habitat in which most of our native plants and animals evolved into smaller patches isolated by roads, development, utility corridors and intensive agriculture. This development and fragmentation also directly decreases overall habitat area. Wildlife are affected through direct mortality from roadkill, increased predation, and decreased productivity due to disturbance and nest predation. Loss of species particularly sensitive to these problems can change the structure and function of the ecosystem.

The Seacoast region has the second highest road density (measured as road miles per 1,000 acres) in the state. The coastal watershed's average forest-patch size of 55.6 acres is second smallest in New Hampshire. Only 14 forest patches larger than 500 acres survived in Rockingham County in 1996. The Seacoast region also has the highest percentage of land cover defined as urban (18.7%) and the highest population density (0.72 people/acre) in New Hampshire. Whether and how Seacoast towns focus growth to protect remaining large contiguous habitat blocks will determine the future for many sensitive species in the region.

ACTIONS/ACTIVITIES

1. Review available region-wide information to identify existing habitat blocks over 500 acres (including the NHEP Critical Lands Analysis maps).
2. Research how maintenance of the contiguous habitat blocks has been approached in other areas of the country or world.
3. Develop a model approach to habitat protection.
4. Educate town officials about the importance of large, contiguous habitat blocks.
5. Ensure coordination of planning model for contiguous blocks of habitat with the regional anti- sprawl growth plan (see LND-6A).
6. Review state actions that influence sprawl for compliance with the state sprawl initiative (see LND-6).

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as New Hampshire Fish and Game Department, NH DRED/New Hampshire Natural Heritage Inventory, UNH Cooperative Extension, The Nature Conservancy, Audubon Society of New Hampshire, UNH Cooperative Extension, Strafford and Rockingham County Conservation Districts, municipal conservation

commissions, and planning boards to discuss the work plan level detail associated with this action prior to its implementation (Steps 1, 3).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

Review of fragmentation status in Step 1	$2,000
Research new approaches in Step 2	$6,000
Municipal outreach in Step 4	(covered by LND-5)
Model approach in Step 3	No cost
State action review in Step 6	No cost
Integration with anti-sprawl growth plan in Step 5	$8,000
Total	**$16,000**

FUNDING

Possible funding sources include EPA Sustainable Development Challenge Grant, New Hampshire Estuaries Project, New Hampshire Coastal Program Grant Program, US Fish and Wildlife's Teaming With Wildlife, Private Foundations.

REGULATORY NEEDS

Pass legislation that allows towns to include biodiversity protection in their land-use regulations.

EXPECTED BENEFITS

- Preservation of habitat areas for sensitive species.
- Increased awareness of the problems resulting from fragmentation of habitat.
- Creation of a model for focusing discussion of growth and biological diversity in the coastal region.
- Creation of a model for towns and cities interested in considering wildlife habitat in land-use decisions.

MONITORING AND ENFORCEMENT

None required

TIMETABLE

This Highest Priority action will be initiated by 2004.

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PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, but would be enhanced by implementation of LND-6A.

HABITAT PROTECTION

PRIORITY

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ACTION LND-34

Encourage appropriate buffers around important wildlife areas and rare or exemplary natural communities.

BACKGROUND

The value of buffers for protecting water quality is well understood, and reflected in a number of town and state regulations. Less understood is the importance of buffers to protect sensitive wildlife habitats and natural communities. Increasing distance from human disturbance increases the value of habitat, and limits both the direct and secondary impacts of human presence – light and chemical pollution, and increased predation by species associated with human development (e.g., dogs, cats, raccoons, skunks).

Buffer requirements for individual species are well known, but it is impossible to specify a single buffer width that will prove adequate for all species. Many species - such as moose, bear, wood turtles, and wild turkeys - range over large areas and use a variety of habitat types. One approach is to identify important habitat areas including, but not limited to wetlands, travel corridors, riparian areas, and vernal pools. Guidelines specific to species and natural-communities will be provided to local communities for these sensitive areas found in southeastern New Hampshire.

ACTIONS/ACTIVITIES

1 Once important wildlife habitat areas have been identified (see LND-32), map these locations of rare and exemplary natural communities and determine appropriate buffers.

2 Work with conservation commissions to adopt appropriate buffers into local zoning ordinances

3 Work with private landowners to create adequate buffers to protect priority areas.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such as New Hampshire Fish and Game Department, NH DRED/New Hampshire Natural Heritage Inventory, UNH Cooperative Extension, The Nature Conservancy, Audubon Society of New Hampshire, UNH Cooperative Extension, Strafford and Rockingham County Conservation Districts, municipal conservation commissions, and planning boards to discuss the work plan level detail associated with this action prior to its implementation (Step 1, 3).

Strafford Regional and Rockingham Planning Commissions will be responsible for editing and redrafting zoning regulations ordinances that establish buffers around exemplary natural communities (Step 2).

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

Priority area identification	See Action LND-32
Adoption of zoning ordinances in Step 2	No cost
Private landowner agreements in Step 3	No cost
Redrafting zoning regulations in Step 2	$5,000
Total	**$5,000**

FUNDING

Possible funding sources include New Hampshire Estuaries Project, New Hampshire Coastal Program grant program, US Fish and Wildlife's Teaming With Wildlife, and private foundations.

REGULATORY NEEDS

Adoption of local zoning ordinances.

EXPECTED BENEFITS

- Increased awareness of the need for protection of wildlife habitat and natural communities.
- Enhanced protection of significant areas through buffering.

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

Target initiation by 2005, but coordinate with completion of LND-25 and LND-32.

PRIORITY

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High Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*, but is related to numerous other actions including LND-25A- D, LND-32 and other actions related to habitat goals, fresh and tidal wetlands, and more.

HABITAT PROTECTION

PRIORITY +++

ACTION LND-35

Maintain the current-use tax program.

BACKGROUND

The current-use taxation program was created by state law (RSA 79-C) to encourage preservation of open space by providing tax incentives to landowners who keep their lands under the current open-space land use. This program has been widely accepted and used by landowners all around the state. Despite many attempts in recent years to change or eliminate this program, it enjoys tremendous support from state agencies, local conservation commissions, environmental organizations, the timber industry, and private landowners. Statewide Program of Action to Conserve our Environment (S.P.A.C.E.) is a watchdog and lobbying organization working to ensure the current-use program is maintained. The changing state tax structure may necessitate a review of the law to ensure it continues to serve its intended purpose of protecting open space.

ACTIONS/ACTIVITIES

1 Keep state legislators aware of the importance of the current-use program to protecting open space in New Hampshire.

2 Track proposed changes to the current-use program.

3 Assess the role of the program in the state's changing tax structure.

RESPONSIBLE PARTIES

The NHEP will convene possible implementers such the Audubon Society of New Hampshire, the Society for the Protection of NH Forests, S.P.A.C.E., and The Nature Conservancy to discuss the work plan level detail associated with this action prior to its implementation.

COSTS

State legislator contact, tracking legislative changes to current use in Step 1	No cost
Assessing role of program in Step 3	$3,000
Total	**$3,000**

FUNDING

This action may be funded through US EPA NHEP Implementation funds. State funds available through natural resource management agencies could also support this.

REGULATORY NEEDS

Currently none but will require further study.

EXPECTED BENEFITS

Protection of habitat, water quality, and other community and regional values by maintaining privately owned open space.

MONITORING AND ENFORCEMENT

None required

TIMETABLE

This Highest Priority action will be initiated be 2004.

PRIORITY

Highest Priority. Implementation of this action is not dependent on implementation of other actions listed in the *NHEP Management Plan*.

HABITAT PROTECTION

PRIORITY
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ACTION LND-36

Encourage conservation easements.

BACKGROUND

Open space for habitat can be protected through two different approaches. One is through state and local regulatory controls, the other is a non-regulatory, voluntary approach using land acquisition and conservation easements. A conservation easement is an agreement between a private landowner and a government, natural resource agency, or organization in which the owner (grantor) transfers certain rights to his or her property (e.g., right to sub-divide or develop the land and the right to mine sand, gravel or other minerals) by deed to the agency or organization (grantee). The owner (grantor) retains all other ownership rights to the land. This sale or gift of development rights ensures that property will remain as open space in perpetuity.

Conservation easements offer advantages for both the community and the landowner. Land protected through a conservation easement remains in private ownership and on municipal tax rolls. The landowner continues to own, maintain, and use the land consistent with terms of the easement, including for timber or agricultural management. Easements provide wildlife habitat and water quality protection, aesthetic values, and possibly recreational opportunities to the community and the environment in perpetuity.

ACTIONS/ACTIVITIES

1. Collect and distribute existing fact sheets on conservation easements, and where to obtain technical assistance, to municipal officials and owners of priority wildlife habitat properties, identified through Actions LND-32 and LND-33.
2. Make land conservation expertise (such as members of Great Bay Resource Protection Partnership) available to municipal conservation commissions at no cost.
3. Present an estate-planning workshop annually in the Seacoast region for owners of identified priority lands.

RESPONSIBLE PARTIES

The Great Bay Resource Protection Partnership will act as lead implementer (Steps 1-3), with assistance from the Society for the Protection of New Hampshire Forests, UNH Cooperative Extension, local land trusts, Strafford and Rockingham County Conservation Districts, Audubon Society of New Hampshire, Natural Resources Outreach Council, and municipal conservation commissions.

IMPLEMENTATION LOCATION

This action may be implemented in any or all of the 43 towns in the Great Bay and coastal watersheds.

COSTS

Collection and distribution of information in Step 1	$2,000
Free land conservation technical assistance in Step 2	$3,000 - 6,000
Estate-planning workshop (annually) in Step 3	$2,500
Total	**$7,500-10,500**

FUNDING

Possible funding sources include New Hampshire Estuaries Program, New Hampshire Coastal Program, private foundations, and other federal funding sources identified in Tables 10.1 through 10.6 in the *NHEP Management Plan*.

REGULATORY NEEDS

None required.

EXPECTED BENEFITS

- Increased acreage permanently protected as open space.
- Increased awareness of land conservation options among municipal officials and landowners.

MONITORING AND ENFORCEMENT

None required.

TIMETABLE

This Highest Priority action will be initiated by 2004. Some steps may be coordinated with implementation of LND-27 in 2001-2002.

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PRIORITY

Highest Priority. Implementation of this action is enhanced by implementation of Actions LND-32 and LND-33.